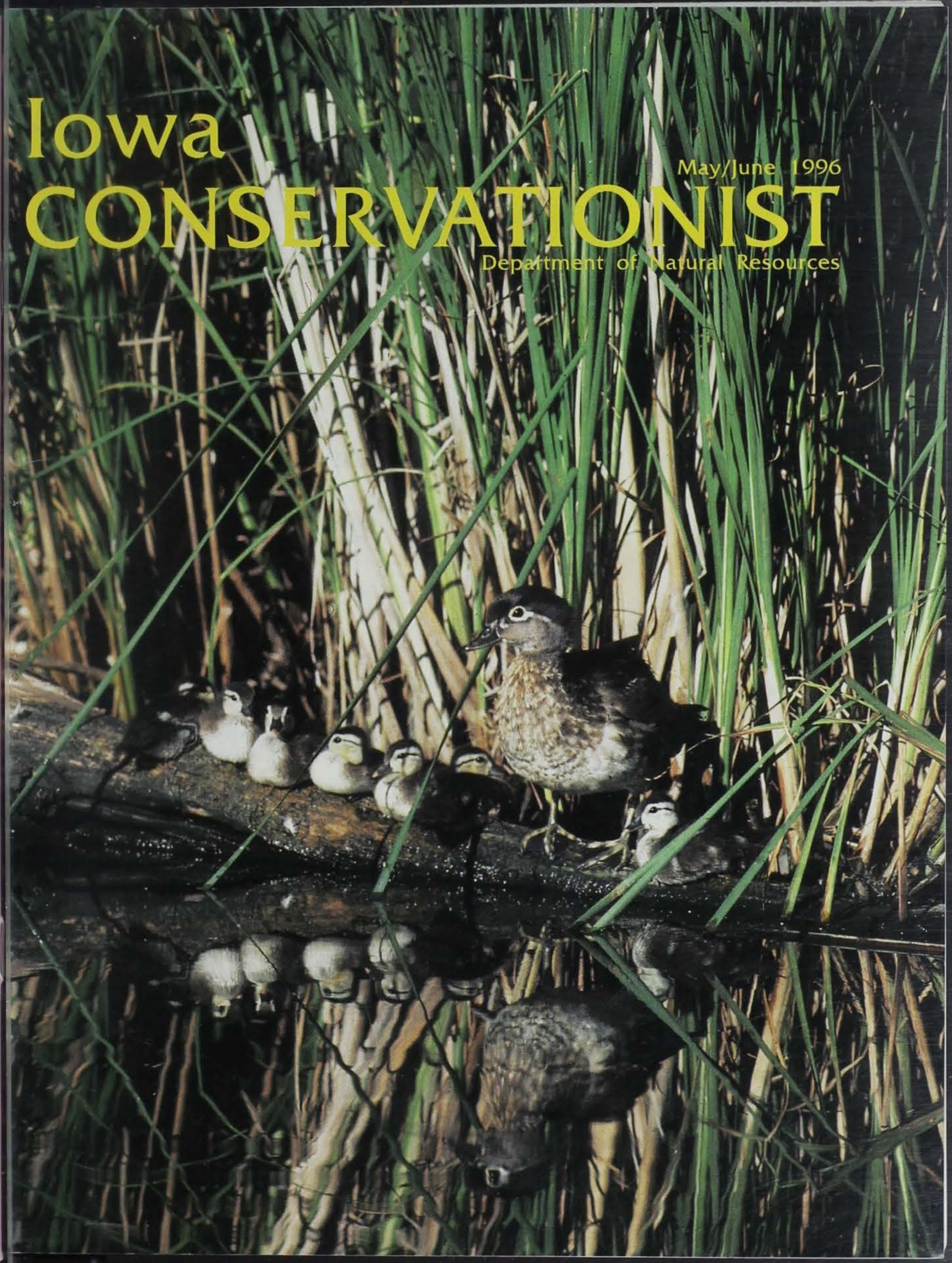
Iowa CONSERVATIONIST

May/June 1996

Department of Natural Resources



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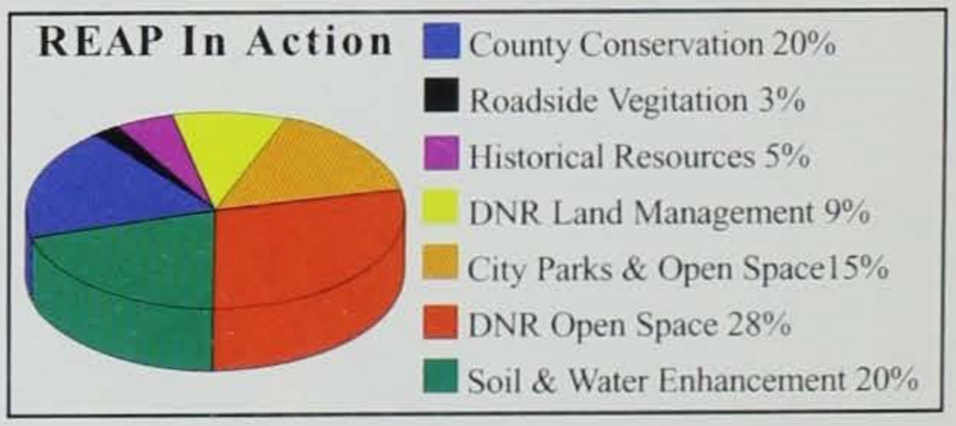

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May/June 1996
Volume 55, Number 3

Iowa Conservationist (ISSN 0021-0471) is published bimonthly by the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034. Second class postage paid in Des Moines, Iowa and additional mailing offices. **Subscription rates: $9.97 for one year, $14.97 for two years and $19.97 for three years. Prices subject to change without notice.** Include mailing label for renewals and address changes. POSTMASTER: Send changes to the *Iowa Conservationist*, Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

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FEATURES

SPECIAL INSERT

State Parks and Recreation Areas of Iowa

DEPARTMENTS

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COVERS

Front -- Hen wood duck with brood by Lowell Washburn.
Inside Back -- Red fox pup by Roger A. Hill.
Back -- Marsh scenic by Lowell Washburn.

Iowa Fencelines

The Neglected Habitat

Roger A. Hill

Lowell Washburn

In the era of small, diversified family farming, fencelines crisscrossed the Iowa landscape. Today, they have largely vanished from much of the state as have free ranging chickens, cribs full of ear corn, and 15-cow dairy herds. Those fencelines that have escaped modern technology currently provide year round wildlife habitat, recreation for humans and continue to serve as a reminder of a simpler time. They are Iowa's neglected habitats.

by
Lowell Washburn

Lowell Washburn

I may have forgotten a lot of things, but the day I bagged my first Iowa pheasant isn't likely to be one of them. The event occurred on a crisp Saturday morning in December of 1959. After having successfully endured a full season and a half of carrying an empty .410 single shot, I was finally locked and loaded with live ammo — a 2°-inch green paper shotshell packed with °-ounce of #6 shot.

Our party of three was walking an overgrown fenceline with Dad and cousin Larry on one side and I on the other. Suddenly, there was a flurry of wings and shots from the other side. Due to the heavy brush, I couldn't quite see what was happening and quickly hurried toward an opening in the cover. About that time a huge cock pheasant (all pheasants are huge to a ten-year-old) broke through the same opening and thundered away, presumably headed for the security of a nearby pasture slough.

What happened next remains something of a blur as I shouldered, cocked and fired the .410. What I do recall with more exacting clarity was that at the sound of the shot, the bird fell from the sky to lie motionless atop the clean snow.

No hunter ever forgets the thrill or the beauty of the moment when that very first rooster pheasant is finally brought to bag. I can still take you to within a yard or so of where that bird fell, and I doubt that any Massai warrior has ever felt more pride over spearing his first lion than I felt about that iridescent, corn-fed, midwinter ringneck.

Thus began my pleasant association with Iowa fencelines, and during the next several years I became acquainted with many such habitats. I soon realized that although these places all shared some obvious things in common, each also contained something unique, such as a rock pile or perhaps a group of red oaks that gave it special character. In effect, each fenceline seemed to claim a personality all its own.

The mechanics of these old time fencelines was pretty straight forward. It most often began when a perching bird or a mammal such as a raccoon, would eliminate droppings containing undigested seeds from a previous meal. Eventually, some of the seeds would germinate and

Lowell Washburn

Lowell Washburn

the plants would mature to bear fruit of their own. This, of course, would attract more birds, mammals and insects, spreading an ever increasing number of seeds. In time, the fenceline would develop its own ecosystem of sorts which, in addition to grassy cover, might include such plant species as wild plum, bittersweet, grape, mulberry, maple, red oak, or Osage orange.

During spring, fencelines attract a wide variety of ground-nesting birds varying from mallards to partridge. Woody cover provides a nesting site for a host of songbirds including thrashers, robins and cardinals.

In all seasons, fencelines are avidly used as travel lanes by everything from fox to deer to wild turkeys. During fall migration, these linear habitats provide much-needed food sources for a variety of birds. The concentrations of small birds and mammals found along fencelines also attract and feed migrating raptors such as sharp-shinned hawks, Copper's hawks and kestrels.

During winter, fencelines serve as windbreaks for many species and provide critical protection from predators. Also at this season human hunters visit the fenceline in search of quail, pheasant, cottontails and venison.

As a young hunter, my very favorite fenceline was actually a network of fences that subdivided a farmstead located a couple miles northeast of town. The purpose of these fences was to restrict the wanderings of a large herd of 30 or so milking Holsteins that frequented the property. (In those days virtually every farm unit had its own swine herd, laying hens and dairy operation. At the time, anything containing more than 20 or 25 milk cows was considered a large herd.)

Lowell Washburn

■ **Fencelines can become "high traffic" areas supporting everything from a nesting mallard, to a preying kestrel, to a white-tailed jack rabbit seeking shelter from the elements.**

Ken Formanek

Roger A. Hill

■ A morning dove's nest, an owl searching for prey, and a spring rooster pheasant -- all found along fencelines as evidence of the need for this type of unique habitat.

Lowell Washburn

Bruce Morrison

■ Fencelines provide critical winter cover, especially in intensively farmed areas. While a species' dependency on fenceline habitat varies from season to season, the fenceline's existence is equally important throughout the year.

Lowell Washburn

Roger A. Hill

oger A. Hill

To me, this farm was paradise. Some of the fencelines were grown thick with wild plum and grape. Others were overgrown with ragweed. The fantasy lines contained plenty of all three.

When deep snows had drifted most of the other covers full, these fencelines became genuine pheasant magnets, and there wasn't a square-inch that wasn't packed down by bird tracks. "Hey, this place looks like a chicken yard," we would always quip at the beginning of a hunt.

However, at times, these particular fencelines could almost become too much of a good thing. As the pheasants we had been pushing began to near the end of the cover and feel the pressure, they would often explode like a cloud of gnats to literally fill the sky with whirring wings and cackling roosters. I was still handicapped by the .410 single, and the only thing I usually managed to shoot was a hole in the sky. I usually fared better on latent rabbits.

I soon graduated to a 12-gauge pump gun and for a time life improved considerably. Then came a rapid series of events that included high school graduation, military draft, marriage and a stint in Southeast Asia.

I returned home a couple of years later, but I never got to revisit those favorite fencelines. The reason? They no longer existed. Technology was advancing as was a shift in political philosophies. "Bigger is always better" was the mind set, and the era of road-ditch-to-road-ditch farming had arrived.

Today, the old time brushy fenceline could easily be listed as an "endangered habitat" in many parts of Iowa. Fortunately, some have managed to survive the past two or three decades of progress. Of course, many no longer corral livestock, but exist simply because taking them out would be more trouble than it's worth.

By the way, the old fenceline where I shot that very first rooster is still standing. I was in the neighborhood the other day, and stopped by to take a look. Essentially, it seemed as if little had changed from the first time I saw it. As I stood there reminiscing about those early boyhood hunts, a rooster suddenly crowed from about a hundred yards down the line. I couldn't help but wonder if he was a descendent of that very first pheasant I bagged.

Wading through the aftermath

Waters of distruction create a flood of good results

by Michael J. Steuck

We watched the awesome devastation on the national and local evening news. Scenes of stately two-story houses with water nearly up to the eves and vast farm fields filled with water. One of the worst floods on record was unfolding before our eyes. For the people living in the floodplains, the flood was a frightening threat to their lives and livelihoods. Luckily, most of Iowa's shorelines on the Mississippi River were spared the devastation experienced in Missouri and southern Illinois. But, we too experienced water levels higher than the massive 100-year flood in 1965. Now, three years later in 1996, scenes of flood damage on the nightly news are like the foggy memory of a fading nightmare. Houses have been repaired, farm fields replanted and human activities have been restored along the riverbank. All of the media attention and concerns of the Flood of '93 were focused on how it affected our property and economic development. However, what were the ecological consequences to the Mississippi River and its floodplain? What about the river's ecosystem and habitat, the fish and wildlife? Floods can be destructive, but was there a beneficial side to of the flood to the river ecosystem? Floods are a natural process recharging river systems, scouring out old channels, releasing nutrients that boost plant and invertebrate growth, increasing fish spawning and nursery habitat, and producing an abundant food source for all creatures living in the floodplain.

The River and Its Floodplain

Many of us that live along the river remember the 1965 flood and its destruction, but it probably won't compare to the destruction of the 1993 flood when all the tallies are in. Five hundred twenty-five counties were included under disaster declarations during and after the Flood of '93.

Michael J. Steuck

■ Waterfowl production in the floodplain was nearly eliminated due to elevated water levels.

Theresa Blackburn

■ This bait shop, located next to a boat ramp on the banks of the Mississippi River, was in one of the 525 counties that received federal disaster aid.

Heavy rains fell throughout the river basin and increased soil erosion from farm fields. Some agricultural fields in Iowa lost 20 tons of top soil from each acre of land in 1993 compared to a normal soil loss of five tons per acre annually. Much of this large sediment load was carried to the Mississippi River. During the flood the river transported about 6.7 million tons of suspended sediment at Dubuque and about 33.7 million tons of suspended sediment at Keokuk. The river could carry all this sediment thanks to water velocities of nearly 17 feet per second. This, however, caused significant amounts of sediment to be transported and deposited in the floodplain on both prime wildlife habitat and cropland. The Missouri River covered more than 250,000 acres of cropland with 2 to 24 inches of sand and 59,000 acres with more than 24 inches of sand.

Many houses and farm fields were flooded because numerous levees used to keep water out of side channels, oxbows, farm fields and to constrict the flow to the main channel, failed throughout the river basin. Water level data showed the impacts of levee failure. As soon as a levee would break or be overtopped, the river stages dropped until the leveed area was full of floodwater, then the river stages rose until another levee failed, and the cycle repeated itself. The locations of levee breaks along the river illustrated the natural meandering nature of the river. These levee breaks didn't just occur where the levee was weak or unstable, they occurred where old channels were cut off or where the river used to flow -- into areas such as oxbow lakes or farm fields. Water level data at St. Louis shows that through the years, as the floodplain was extensively leveed, water levels have increased 8 to 10 feet, even when the same volume of water flows through the dam. The levees effectively constrict the river resulting in higher water levels instead of allowing the water to spread out over the floodplain.

Many positive events also occurred

Gordon Farabee

Gordon Farabee

Top to bottom:
■ Flooded farm fields, timber and islands provided tens of thousands of acres of ideal feeding and spawning habitat for fish.
■ Seeds carried and deposited by the flood began to sprout soon after the floodwaters receded (notice the high-water mark in the trees).

in the river and its floodplain during the Flood of 1993. High flows scoured sediment from areas where it had been deposited in the past. Channels were scoured through backwaters and sloughs. The river deposited nearly one half inch of sediment per year form 1988 to 1992, at sediment transects on Pool 13 near Bellevue, but the flood actually removed sediment from these same transects in 1993. High water levels throughout the whole river floodplain seeped through layers of soil and rock, filtering and cleansing the water along its way into underground aquifers, recharging the water supply for many wells along the river corridor.

Fish, Wildlife and Their Habitat

Besides impacts to humans, the flood also had a definite impact on fish, wildlife and habitat throughout the floodplain. Understandably, some of these impacts were negative. On the Upper Mississippi River from Burlington down to southern Illinois, 18 to 37 percent of the mature trees were killed, 70 to 80 percent of the saplings died and the small seedlings were nearly wiped out. The forbs and grasses on the islands were also flooded out. Water levels over-topped most, if not all, islands and destroyed waterfowl nests, plus the dens of muskrats, beaver, mink, raccoons and snakes. Reproduction of most land animals was unsuccessful in 1993, while most animals fought for their lives. Many animals died or were forced to find refuge in upland areas outside the floodplain.

Elevated water levels also increased the spread of zebra mussels and exotic plant species recently infesting the Mississippi River. High water levels and flows gave zebra mussels access to areas not colonized in previous years, such as backwaters normally shielded from the main channel.

The flood also had many positive impacts on fish, wildlife and habitat on the river. Heavy rains carried seeds from the uplands to the river and the floodwater distributed the seeds throughout the floodplain. The flood waters helped to reintroduce or increase the foothold of native species and aid in dispersal of oak, hickory, maple and other plant seeds. The sustained high water killed much of the purple loosestrife in the floodplain. An exotic plant species from Europe, purple loosestrife colonizes disturbed areas and out-competes the native plant species that wildlife depend on.

Sustained high water also provided a bonanza for fish looking for spawning habitat. Flooded farm fields, timber and islands provided thousands of acres of perfect habitat for spawning fish. Numerous fish species, including largemouth bass and bluegill, took advantage of this newly created habitat and had one of their best spawns in years. Small fish feasted on invertebrates colonizing the flooded habitat. The flooded vegetation also provided much needed cover for the newly hatched fish, increasing their survival. Predators, in turn, took advantage of the abundance of small fish and indulged in a fish smorgasbord.

The increase in available food items like invertebrates and small fish has provided the stimulus for increased fish growth since the flood. These positive responses observed during the flood support a theory called the "flood pulse concept" which predicts riverine communities will increase production during and after flood events due to increased availability of nutrients and suitable habitat. We should begin to see the benefits of this increased production during the next few years, with higher catches of plump, healthy bass, bluegill, catfish and crappie.

In the Future

In the future, more floods will occur. From what we've learned so far, human structures in the floodplain do not fare well, but there are many long-term positive gains for the river environment, and the fish and wildlife that live there.

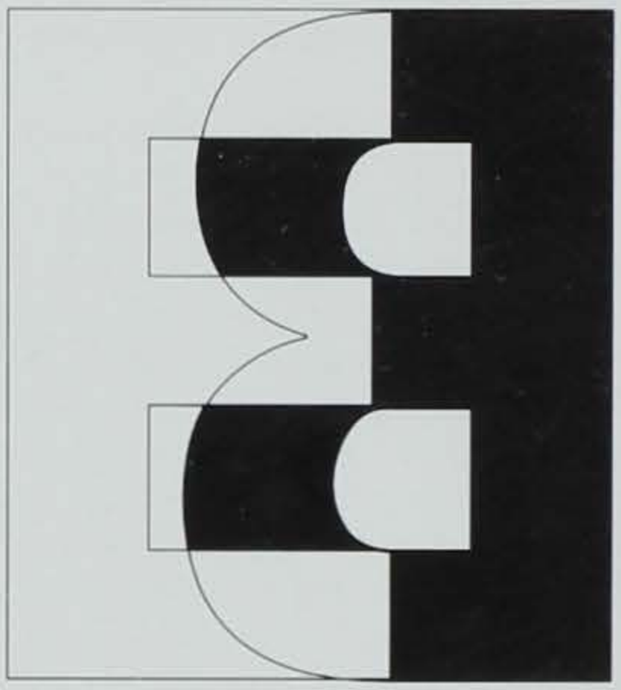
We need to be concerned with our activities in the floodplain. We levee off areas and build in the floodplain, knowing the river will flood sooner or later. We degrade fish and wildlife habitat for our own benefit. Nature takes care of a river using floods as one of its tools. Water-supplying aquifers were recharged, new channels were cut, fish took advantage of the abundant habitat and food. Barren shorelines and islands quickly revegetated as the waters receded. The question we need to ask is -- Should we continue to constrict the river and try to train it to stay within its banks, knowing floods are a part of the natural cycle to refresh the ecosystem and give it new life? So the next time the river floods, don't think of it as destructive, think of it as a beneficial shot in the arm for the river's ecosystem and the fish, wildlife and other organisms living there.

Michael J. Steuck is a natural resource technician for the fisheries bureau at the Mississippi Monitoring Station in Bellevue.

Scott Gritters

■ Fish took advantage of the flooded habitat, producing an excellent year class of fish and providing abundant food for bass, walleye, northern pike and other predators.

Meet the Energy Bank



Iowa energy bank Program

by Patricia S. Cale

Before the Energy Bank Program, rising energy costs plagued public sector agencies, and money to make energy efficiency improvements was hard to find. The Iowa Department of Natural Resources recognized this problem and developed the Iowa Energy Bank Program to combat it.

The Energy Bank's main goal is to save energy. It achieves its aim by bringing together the parties necessary to identify and implement energy management improvements in Iowa's public schools, hospitals, private colleges, private schools, municipal utilities and local governments.

The program is so successful mainly because it is so flexible. Monica Stone, Executive Officer of the Building Energy Management Team, says, "The only hard and fast rule for the Energy Bank is that we will do what is possible to help a client save an energy dollar where it is cost effective." Funds for energy improvements are virtually unlimited and available upon demand in the form of low interest loans from regional and local banks.

By 1998 the Energy Bank Program will have helped public sector facilities invest $300 million. The program will save Iowa taxpayers over $50 million in excess energy costs annually. Such an investment will also be responsible for the reduction of a million tons of carbon dioxide, as well as thousands of tons of nitrous oxide, particulate air pollution and sulfur dioxide.

The investment takes more than money, however, to be a success. Client participation is the greatest measure of the Energy Bank's ability to accomplish its goal of making Iowa's public buildings energy efficient. By managing energy wisely, schools, hospitals, local governments and private colleges play a significant role in saving tax dollars, reducing pollution and creating jobs. The following case studies illustrate some of the recent success stories in the Iowa Energy Bank Program.

Patricia S. Cale is the energy information coordinator for the department.

Energy Success Case Study

GREENE COUNTY Medical Center

Hospitals are energy-intensive operations. Energy improvements are helping bring down this public hospital's costs of operation by $37,500 per year.

Hospitals operate 24 hours a day, 365 days a year. Energy plays a major role in creating a comfortable environment for patients, powering life-saving equipment and providing adequate light for important medical treatment.

Making the Most of Resources

Supplying that energy can create significant costs, adding to the overall cost of medical care. The Greene County Medical Center's mission is to make the most effective use of financial, natural and human resources in providing quality health care. To that end, the Medical Center took steps through the Iowa Energy Bank Program to reduce its energy use.

Energy Improvements

Improvements implemented at the hospital include:

- Athermal ice storage system, which takes advantage of lower electric rates at night to freeze ice that is then used to cool the facility during the day;
- An energy management system that monitors and controls energy use;
- New, more efficient and more effective lighting;
- Additional insulation.

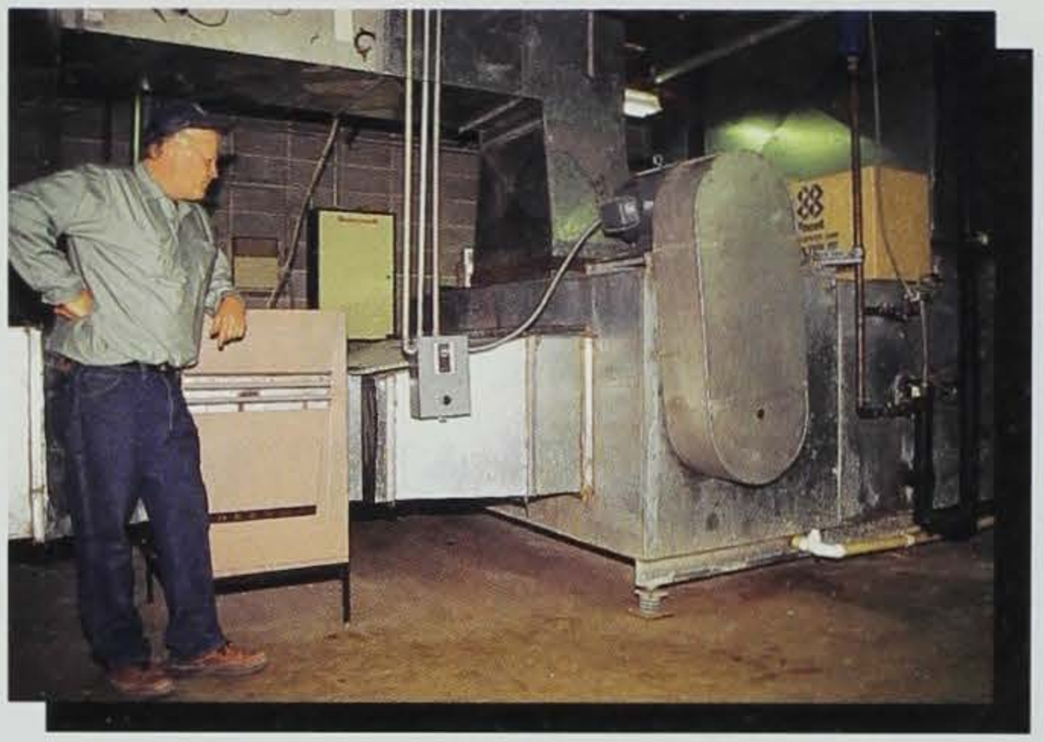
Investment Means Savings

For an investment of $367,000 (including a $30,000 rebate from Iowa Electric), the hospital will save $37,500 per year.

Patients Benefit

"If we can save money on energy costs, we can use that to keep costs down for the patients who use our services. But not only that, we've been able to provide a more comfortable environment for our clientele and our staff," said Karen Bossard, medical center administrator.

Iowa energy bank Program



Energy Success Case Study

DEXFIELD Community School District

Dexfield's energy management system monitors schools' energy usage 24 hours a day through fiber-optic phone lines that help manage energy use.

After replacing the electric heating systems in two school buildings with natural gas heat, Dexfield saw a significant reduction in their heating costs. The new energy management system is monitored through fiber-optic phone lines that run from four individual school buildings to the Georgia firm.

Get With The Program

Dexfield borrowed $200,000 from Norwest Investment Services through the Iowa Energy Bank Program. Dean Turner, Superintendent of Dexfield's school district, said that the idea is that the energy savings derived from energy efficiency improvements will pay back Norwest. Dexfield has two year payoff.

"Both of them helping us to arrange the loan was an important part," said Turner. He said that the Iowa Energy Bank Program was cost-effective, and he's happy about that.

Program Benefits

An initial $140,000 investment is saving Dexfield's schools $25,000 annually in heating and electricity costs, and they're using less energy to do it.

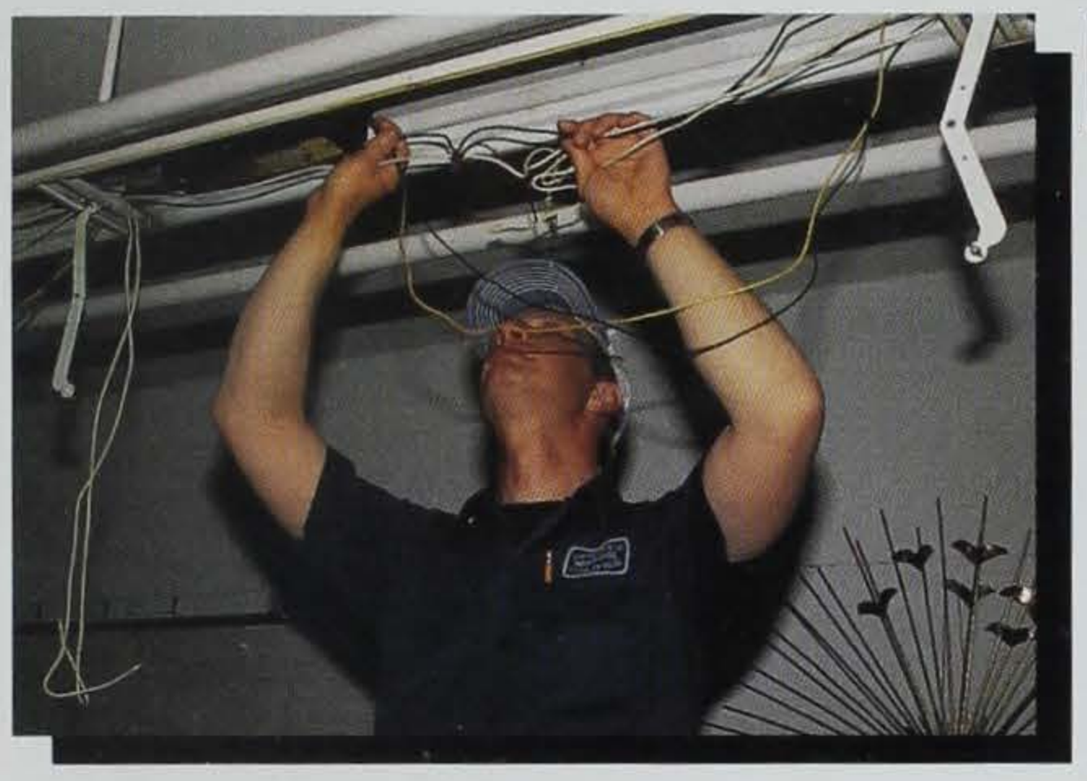
"Saving fuel is one of the main things," said Turner. "I know our electricity bill is way down." In the past, Turner said, "the heat was so darn expensive that we didn't turn it on very often."

Actual Improvements

Several improvements were made to the industrial art, building/shop, junior/senior high school, and elementary school buildings.

- Replacement of electric heating systems with natural gas heat;
- Lamp and ballast replacement in fluorescent lighting for more efficient and effective lighting;
- Insulation added to the junior/senior high boiler, steam and condensate pipe;
- An energy management system implemented to monitor and control energy consumption continuously;
- Installation of electric ignition in shop building.

Iowa energy bank Program



Energy Success Case Study

SPENCER City Hall, Library and Police Station

Everyone in the Spencer community wins as new lights in city facility brighten the financial future.

A visit from an Iowa Energy Bank Program representative spurred an interest in energy management that led to a cooperative arrangement between the Spencer Municipal Utility and the city council. As a result, lighting improvements have been made in the Spencer city hall, library and police station.

Utility Support

Many utilities in Iowa are offering financial incentives to public agencies to cut energy use. The Energy Bank Program helps public agencies learn about and take advantage of such offers. In Spencer, the municipal utility paid part of the cost of energy audits, advised the city on energy-saving fixtures and provided rebates on new lights. "It's a win-win situation for the community. If public agencies save energy and money, it will benefit everyone in the community," said Leon Rodas, utility assistant general manager.

Energy Improvements

The lighting improvements identified in the three buildings included:

- Fitting 354 two-bulb fixtures with new electronic ballasts and more efficient T-8 bulbs, saving 27 watts per fixture; and

- Fitting 66 four-bulb fixtures with new ballasts and bulbs, which use 83 watts less.

24 Hour a Day Savings

At the police department, many of the lights are on around the clock. Replacing 55 four-bulb fixtures with more efficient ones cost the police department $1,760, with the utility rebates. Since they will use $1,600 less in electricity, the lights will pay for themselves in just over a year.

An Energetic Community

The city buildings are not the only public facilities making energy improvements in Spencer. Also participating in the Energy Bank Program, with assistance from the municipal utility, are the Spencer Community School District, Clay County and Spencer Municipal Hospital.

Iowa energy bank Program

Energy Success Case Study

DRAKE University

Finding opportunities for energy management improvements in ten different buildings on campus, Drake University can save $249,989 yearly in energy costs.

After the Energy Bank Program fronted the cost of an energy survey, Drake University went forward to make major improvements on its campus. "We knew we had lots of opportunities for energy savings, but we never tried to formally engineer a program," said Paul Morris, assistant director of the Physical Plant at Drake University in Des Moines.

Improvements Made

Most of the ten buildings had all of these improvements made:

- Replacing lamps and ballasts;
- Installing occupancy sensors;
- Installing time clocks on hot water pumps; and
- Installing energy efficient motors.

Specific Improvements

The university also made specific improvements to some of the buildings. They include:

- Connecting the Education Building, located a block away from the main campus, to the campus control system;
- Remodeling the air distribution in Meredith Hall;
- Adding new roof insulation to Old Main; and
- Replacing the roof-top unit on the Health Sciences Building with a high-efficiency furnace.

Major Savings

The biggest improvement made to the campus was replacing the single-glazed glass at Medbury Hall with double-glazed, and insulating the panels. The Energy Bank projects that the savings to this building alone will be $20,100 annually.

The total cost of the university-wide project was $950,000. The total projected yearly savings of energy on the university's campus is $249,989, providing a simple payback in 3.8 years.

Top Priority Fulfilled

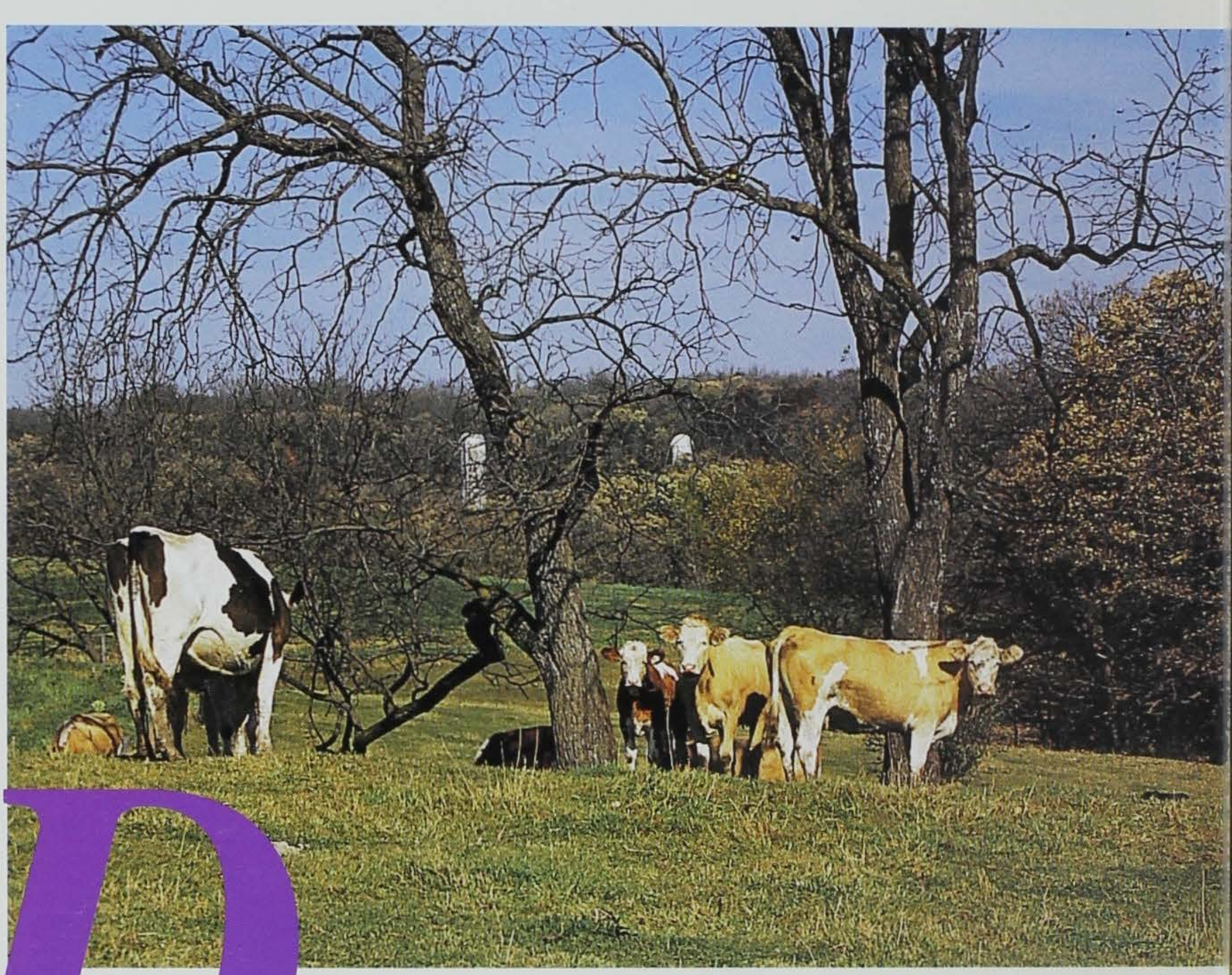
"Our biggest priority was reducing our electric load and we're in the process of doing that," said Morris. "We're pleased with the improvements made."

Iowa energy bank Program

The brilliantly hued brook trout was once an abundant inhabitant of extreme northeastern Iowa. Today, the species has been reduced to a single, truly wild population. Scientists are still searching for answers as to how these trout have managed to survive while others vanished. They are the . . .

Mystery Fish of South Pine Creek

Article and photos by Lowell Washburn



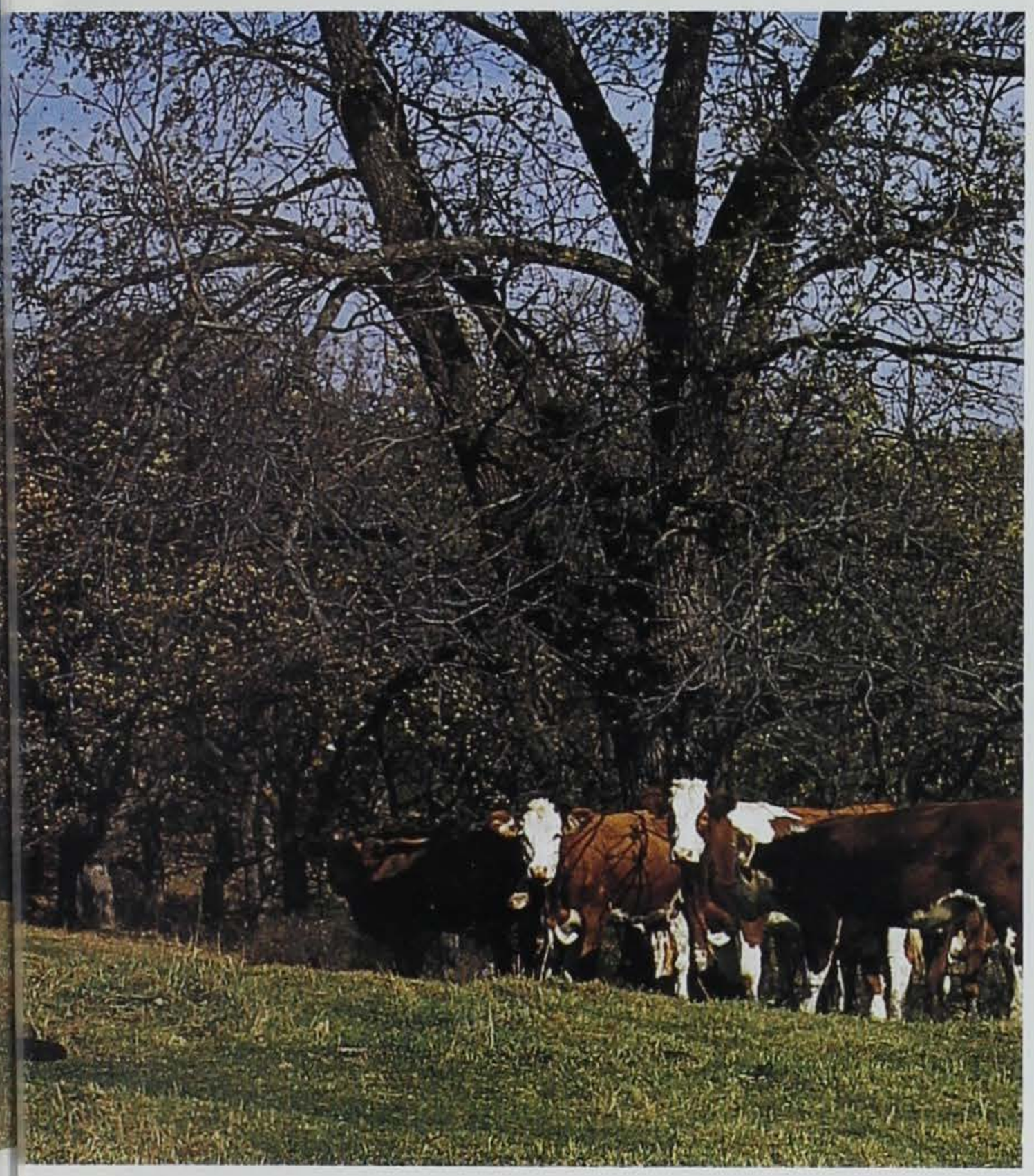
During even the coolest of mornings, it's a long, sweaty walk leading into the valley of South Pine Creek. Pausing to catch a breath or swat a persistent deer fly, one can only hope the walk will be worth the effort. Soon, the last bit of topography separating this valley from the rest of the world is crested, revealing the first glimpse of stream.

Initial reaction might be one of disappointment. From the hilltop, South Pine Creek doesn't look like much. The creek is small, in fact, in many places narrow enough to jump across.

But don't judge too quickly. Belly-crawl to the edge of the high bank alongside the first sizable pool encountered. Once there, disappointment will turn to astonishment, as it does to many upon a first visit to the stream.

I'll never forget the effect of gazing into the crystal pool and seeing a group of nearly two dozen adult brook trout gently finning into the current. The trout, many of which would reach or exceed the 12-inch mark, were stacked like cordwood at the pool's headwater. The next thing I noted was their color. Although I had encountered brook trout in Western streams as well as two other Iowa waters, I had never seen anything like these beauties. If only a single word could be used to describe their brilliance, it would have to be "neon." From jaw to tail, their perfection was beyond description. I was looking at the wood ducks of the fish world.

Like many trout fishing enthusiasts, I had heard tales of these fish for years, and for once, reality had matched legend. But for me, the greatest first impression was not the numbers, size or even the beauty of the fish. Instead, it was realizing this fish population may have existed in this very watershed, perhaps in this very pool, since before the first European settlers had come to the valley. At the very least, these brook trout had here longer than anyone can remember.



■ **Sparse vegetation caused by grazing cattle at South Pine Creek's watershed resulted in poor fish conditions. As protective measures were implemented, the water quality and fish vastly improved.**

Rumors of a self-sustaining, wild population of brook trout in Winneshiek County's South Pine Creek have long been an established facet of northeastern Iowa's outdoor lore. The trout's association with humans during the past quarter century is well documented (see *Survival Against All Odds*, pg. 24) and many of the historic aspects of this fish population remain the focus of ongoing investigations.

"For several years [the DNR] had received reports from serious trout [anglers] that South Pine Creek harbored a population of brook trout," said Gaige Wunder, Decorah State Fish Hatchery management biologist .

Although biologists considered the accounts credible, fisheries personnel were not able to conduct the first survey of the stream until 1974.

The good news, according to Wunder, was "Essentially what we documented during the first inventory was that there was, in fact, a viable population of [brook trout] in South Pine Creek. We also found an overall good run of sizes which indicated to us that spawning success was occurring, not just sporadically, but on a fairly consistent basis."

The bad news was biologists had also found some definite areas of concern. For example, the watershed surrounding South Pine Creek was heavily influenced by land use practices like row cropping and was also under intense grazing pressure. Included among the most obvious symptoms were areas of severe bank erosion.

"As is the case with most of our smaller spring-fed streams, the water clarity was still pretty good at the time of that initial survey," said Wunder. "However, I think it is fair to say that between the runoff and cattle use, the overall quality of the water had been greatly compromised." As a result, the entire stream ecology had suffered.

"One of the things we immediately noted was that the creek had very, very limited growths of watercress, which is typical for heavily grazed streams," said Wunder.

Biologists say the importance of watercress to the total health of an Iowa trout stream cannot be overstated. Watercress stands well, providing vertical as well as overhead fish cover. Since the plant tends to grow along shallower stream margins, it acts as an effective silt trap. Beds of watercress have a banding effect which tends to restrict water flow and increase stream velocity. It also functions as an underwater breeding ground for aquatic insects, greatly enhancing a stream's capacity to produce food. Essentially, watercress is to a trout stream what cattails are to a marsh.

"We were also concerned that, in spite of the fact that we did find fair to good numbers of trout, the fish were not in very good physical condition," said Wunder. "They were what we sometimes refer to as streamliners — fish with low body weights, no sag in the gut area, just plain skinny."

Although the trout were in an undernourished condition, biologists were excited to document, for the first time in modern history, a truly wild population of brook trout in Iowa.

"Right away we knew that providing long-term protection for this population should become a priority," said Wunder. "Of course, we knew that if this property ever came up for sale, we would be very interested in acquiring it."

As an increasing number of anglers became aware of this unique resource, fish managers began to wonder if the population was being overharvested. Since the stream was in private ownership, the trout were afforded

If only a single word could be used to describe their brilliance, it would have to be "neon."

From left:

- **Stunned brook trout gathered in an electro-fishing survey show excellent body condition among all age groups.**
- **An electro-fishing survey of South Pine Creek was used to determine quantity and quality of brook trout. Beds of watercress indicate a health trout stream.**
- **An adult male brook trout in spawning color.**

little protection beyond what individual landowners were willing to give.

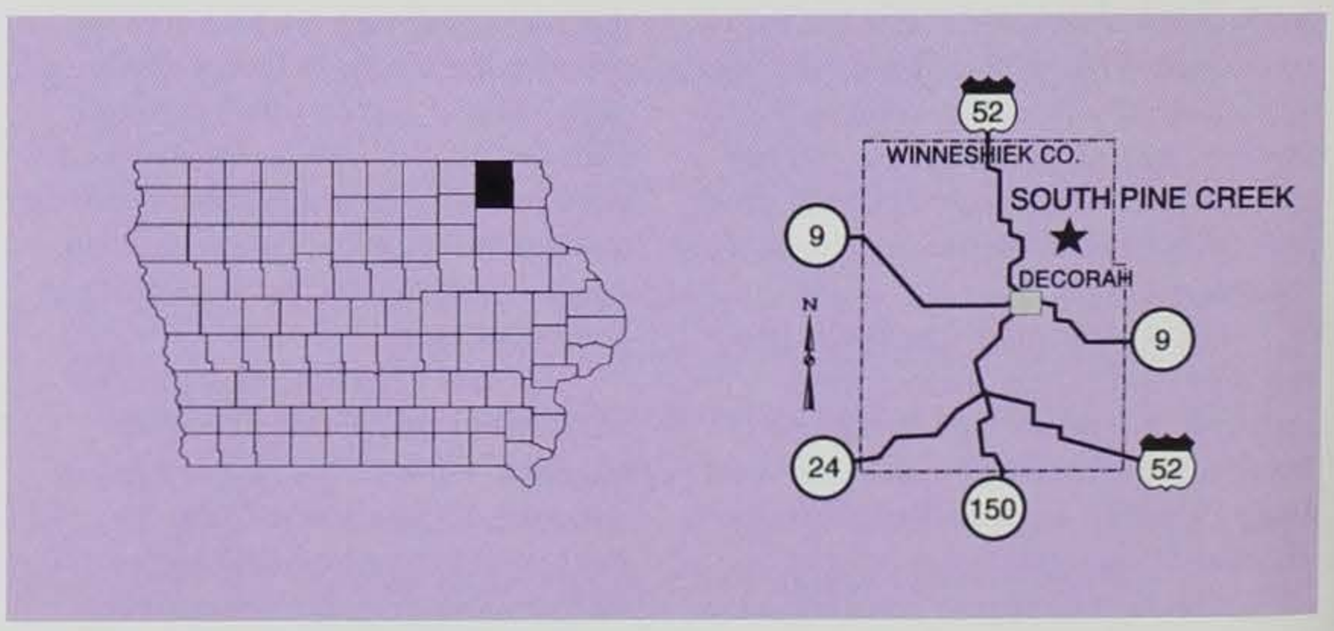
"We began to visit with the landowners and discovered they were very aware of the brook trout and were actually quite restrictive on the number of anglers they allowed on the stream," said Wunder.

"We also interviewed some of the anglers using the stream and found they were taking fish, and even some limits," noted Wunder. "But, we felt as if these instances were rather low, and left feeling pretty good over the way the property owners were protecting the trout," he added.

During the autumn of 1974, fisheries personnel returned to South Pine Creek in an effort to locate actual spawning sites used by brook trout.

"We didn't really know how often the stream was providing suitable spawning conditions, if it was every year, every other year or every third year," said Wunder. Unfortunately, biologists were unable to locate any active spawning sites.

"We would have liked to conduct more survey work on South Pine, but we really didn't want to press our luck and wear out the welcome," said Wunder. Instead the DNR turned to an



educational effort aimed at reinforcing the notion that this tiny creek did indeed contain an unusual natural treasure. The importance of protecting this unique resource was reiterated to landowners.

The Iowa Natural Heritage Foundation also became active in seeking ways to protect South Pine's wild trout. The property eventually came up for sale and the Natural Heritage Foundation purchased the farm. The foundation then sold the valley containing the main stream corridor, as well as land bordering a major tributary, to the Iowa DNR. The Natural Heritage Foundation also began negotiations to trade the property's remaining crop ground to landowners who held other tributaries of South Pine Creek. Those negotiations are expected to be complete by late this summer.

"The beauty of this whole partnership process is that the Iowa Natural Heritage Foundation was able to cut the red tape and move quickly when the farm was put up for sale," said Wunder. From a land use perspective, this stream has been adequately protected on the state property. With continued cooperation from adjoining private property owners, the entire watershed should be cleaner and provide better water quality for all users of the stream.

In the two years following increased environmental protections, changes to the stream have been both immediate and positive. In the absence of grazing, wild turkeys, deer and songbirds are more frequently observed in the valley, and cut bank erosion has virtually ceased. Beds of watercress now grow in profusion, further reducing erosion and siltation. The increase of food production in the stream been described as phenomenal and trout have responded dramatically to the changes.

"There is no question we have seen a very positive response, both in terms of fish quantity and quality," said Wunder. "The changes in health are very obvious. These fish have a much better body condition and more vivid coloration by far than those we looked at back in 1974. These trout just seem to glow, and there's no doubt they are a better quality fish." Fish numbers are also on the increase, up significantly from the 1974 count.

"We're extremely encouraged," said Wunder, "not simply because the totals are up, but also because we're seeing a full gamut of fish ranging from yearlings on up to 15-inch adults. It's simply incredible."

"I think that everyone involved with this project has felt a great deal of satisfaction," said Wunder. "It's just a good thing to know that these fish are secure and will be here for a long time to come."

Survival
Against all odds

Biologists are knee-deep in brook trout history in hopes of determining how the once-abundant Iowa native has nearly vanished, with the exception of those in Winneshiek County's South Pine Creek.

The colorful brook trout is the most stunningly beautiful species of the entire salmon family in the eyes of many fly fishing enthusiasts. Purists are quick to point out, however, that the brookie is not really a trout at all, but rather a member of the char clan, merely a southern cousin to the popular fighting fish of remote, subarctic lakes.

The brook trout is, however, undisputedly the only trout native to Iowa. Historically, the species has been abundant in the cold water streams of extreme northeastern Iowa. Even more so than other trout species, brookies demand clean, cold, highly oxygenated water for survival. They are also the fish most susceptible to common trout ailments and diseases. Due to their general inability to cope with negative changes within their environment, brookies vanished from the state within a few decades of settlement.

Yearling wild brook trout.

Happily, there is one exception. At Winneshiek County's South Pine Creek, anglers can still cast a fly to a wild, self-sustaining population of brook trout. To assure continuation of this population, the DNR has placed a catch-and-release, no-kill regulation on this stream.

"In Iowa, we have three streams where production from previously stocked fish occurs on a rather sporadic basis," said Gaige Wunder, Decorah State Fish Hatchery management biologist, . "But, South Pine Creek is unique from the vantage point that it is the only known stream producing naturally spawned fish on such consistent basis that it supports a viable, consistent population of totally wild trout."

The question has often been raised over the years as to why wild fish were able to survive in this tiny stream, while disappearing from all others. Nobody really knows the answer.

"Generally speaking, brook trout are extremely vulnerable to angling," says Wunder. "But these trout are definitely not that way."

In sharp contrast to brookies found elsewhere, the trout of South Pine Creek are just plain tough to catch. After the first fish or two is hooked, it is as if the rest of the population senses that trouble is afoot. From that moment on, it is hard, if not impossible, to buy another strike.

There also remains a question as to the exact origin of the South Pine trout. According to Wunder, there are really only two possibilities. Either these same fish represent a population that existed here prior to settlement, or they are the product of early stockings that may have occurred during the 1930s. Either way, they are a remarkable group of fish.

After the brook trout spawned last fall, flesh samples for DNA analysis were taken from South Pine fish in November. According to Wunder, stocked trout would have to come from brookies originating from eastern North America. Complete DNA listings are available for such fish. If the Iowa samples do not match any known genetics, then it is reasonably safe to assume the fish are remnants of a native population.

Sperm samples were also gathered last November and have been used to effectively open a genetic bank account at Iowa State University. "Our first concern was protecting these genetics in case some unseen catastrophe should occur," said Wunder. "This way we will have at least half of the genetic formula in storage."

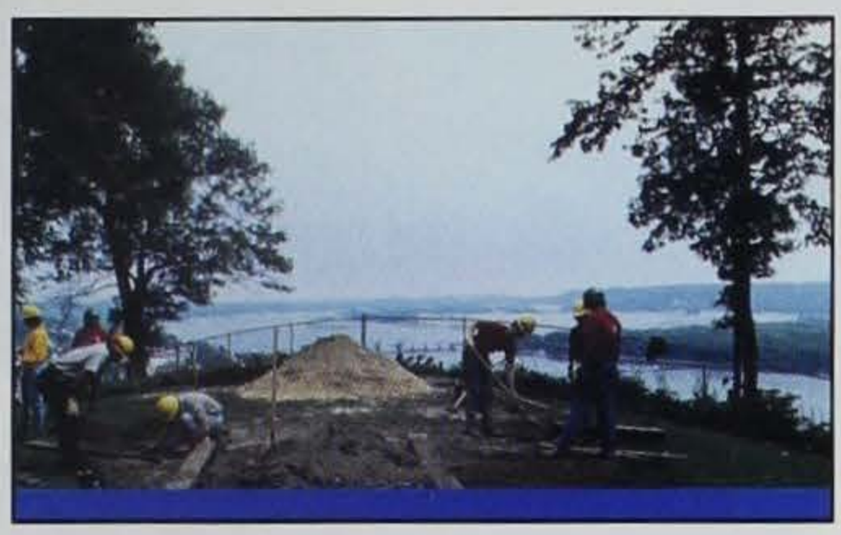
In order to pioneer future populations in other suitable Iowa streams, biologists may also use the frozen sperm to produce hatchery trout.

"We may never know exactly where these fish come from or why they're still here, and perhaps it really doesn't matter," said Wunder.

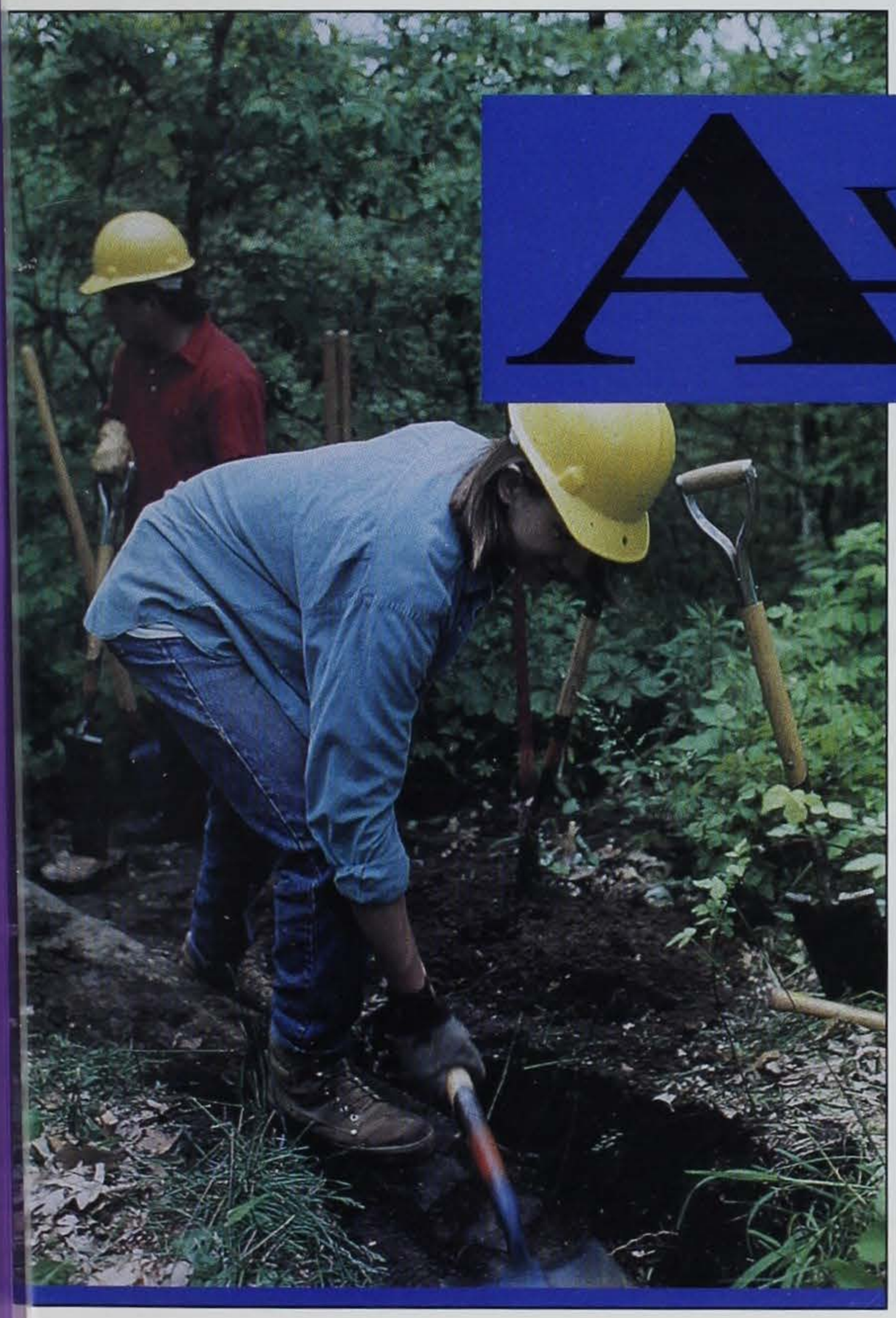
Regardless of their origin, these fish have stood the test of time. They have resisted angling pressure. They have resisted disease, tolerated the relentless heat of Iowa summers, and have endured countless environmental changes due to intense land use.

"These fish are unique. They have remained in spite of all odds," Wunder said. "These are the survivors."

--L.W.



■ Civilian Conservation Corps workers at Pikes Peak State Park and Mines of Spain State Recreation Area.



A Valuable Experience

"I have been to these parks before but never had the same eye-opening experience that it gave me after a summer of trail work."
-- Tim Parizek, ICC

The Iowa DNR has received grants since 1989 through the Department of Economic Development to hire young adults to work in our state parks and recreation areas. The grants were established to accomplish meaningful, productive work and provide gainful employment and training for our youth. The program has been a tremendous success for our state parks, tourism, economic development and 134 individuals involved.

The Iowa Conservation Corps (ICC) is based on a legacy established

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Article and photos by
Mark Edwards

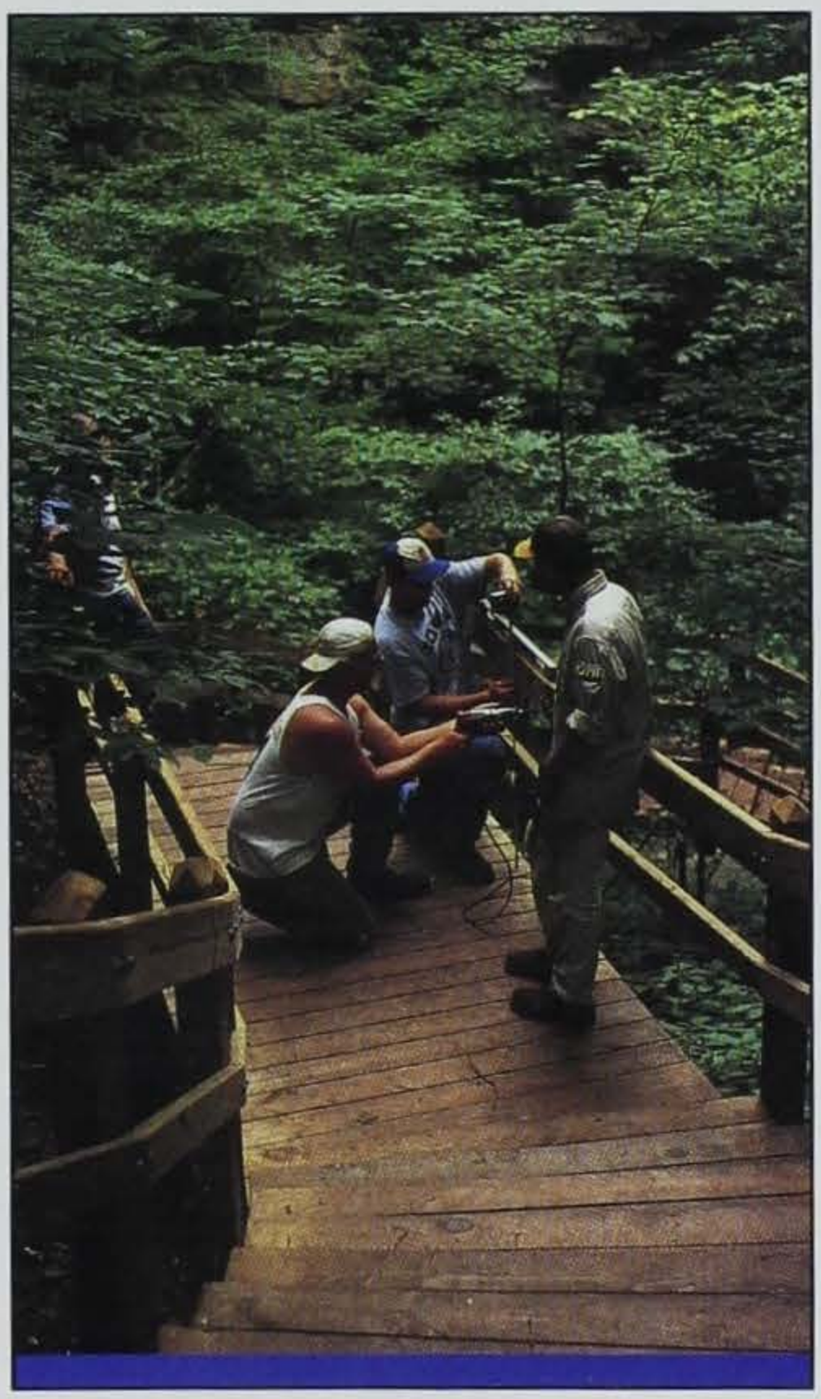
"This summer we went through about 750 railroad ties, 2,000 feet of rerod, and 70 some tons of limestone. The facts speak for themselves." -- Greg Frommelt, ICC

by the 1930s Civilian Conservation Corps (CCC) program. In Iowa, as elsewhere, the CCC probably contributed more to the development of state parks in a shorter period of time than any other government agency before or since. Six hundred CCC-built structures, such as lodges, shelters and bridges, still stand in Iowa's state parks.

During the 1930s, Iowa had one of the largest state park systems in the U.S. Iowa was not among the first states to establish state parks, but as the movement gained momentum, it quickly took a leading position. Today, Iowa ranks 46 in percentage of land in state and federal ownership with only one-tenth of one percent of the state's area in state parks. Iowa has more than 11 million day-users per year enjoying these areas, using more than 400 miles of trails. Their popularity requires constant maintenance and restoration to protect the natural resources while providing visitors with a safe, enjoyable experience.

The ICC program plays a significant part in this effort by constructing and restoring miles of trails, installing hundreds of erosion control structures, and contributing to many other conservation projects. The appraised value of the work completed suggests the parks have received at least twice the amount of work at half the cost, than if the work had been put out for bids like most state park improvement projects. This is not meant to imply contractors or state employees were replaced by the ICC program. Quite simply, most of the work would simply not have been done.

"This work will allow me to bring my grandchildren here and tell them that I helped to build these trails." -- Bryan Hansel, ICC



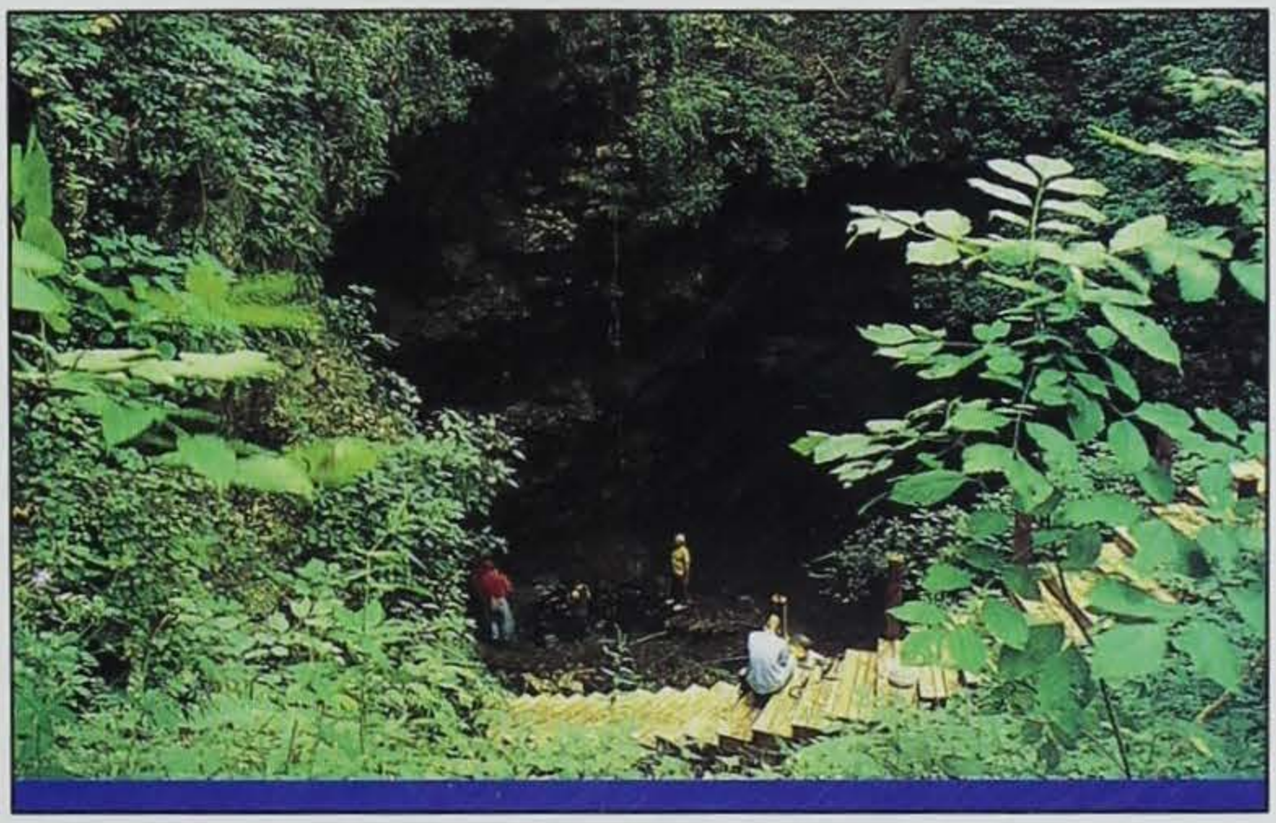
Opposite page:
■ Civilian Conservation Corps workers at Ledges State Park in the 1930s.
Far left, clockwise:
■ Conservation Corps workers at Dolliver and Maquoketa Caves state parks.

The DNR hopes to use the ICC program for many years t for the benefit of our natural treasures and to encourage enrollees to become self-directing members of society.

Since 1989, Conservation Corps grants have been used at Maquoketa Caves and Bellevue state parks in Jackson County; Dolliver Memorial State Park and Brushy Creek Recreation Area in Webster County; Mines of Spain Recreation Area in Dubuque County; Pine Lake State Park in Hardin County; Springbrook Recreation Area in Guthrie County; Wildcat Den State Park in Muscatine County; Elk Rock State Park in Marion County; Ledges State Park in Boone County and Pikes Peak State Park in Clayton County.

Mark Edwards is a trail construction supervisor with the department's Parks, Recreation and Preserves Division.

"I have seen first hand how all these things -- flora, fauna, soils, erosion and people -- are interconnected and cannot be taken as separate entities." -- Jim Capecchi, ICC



What Goes Around Comes A

by Elizabeth Hicks

Critics complain that state government is wasteful. It is true that the State of Iowa generates a lot of garbage, just like any other Iowa business or industry. However, when it comes to managing and recycling this waste, the State of Iowa is making money, not throwing it away.

For every ton of material recycled, the State of Iowa saves $30 in landfill fees and receives revenue from the recycling vendor. In 1995, the State of Iowa received more than $14,500 in revenue from recycled materials. In addition to these financial benefits, valuable natural resources were conserved. For every 10 tons of paper and cardboard recycled, 168 trees, 24 barrels of oil, 23 cubic yards of landfill space and 70,000 gallons of water are saved.

From the Hill. On February 13, 1989, Governor Terry E. Branstad enacted Executive Order 37, requiring all state agencies to participate in office paper recycling programs and buy recycled efforts. In February 1996, this executive order was updated to expand waste reduction, recycling and buy recycled efforts by state agencies.

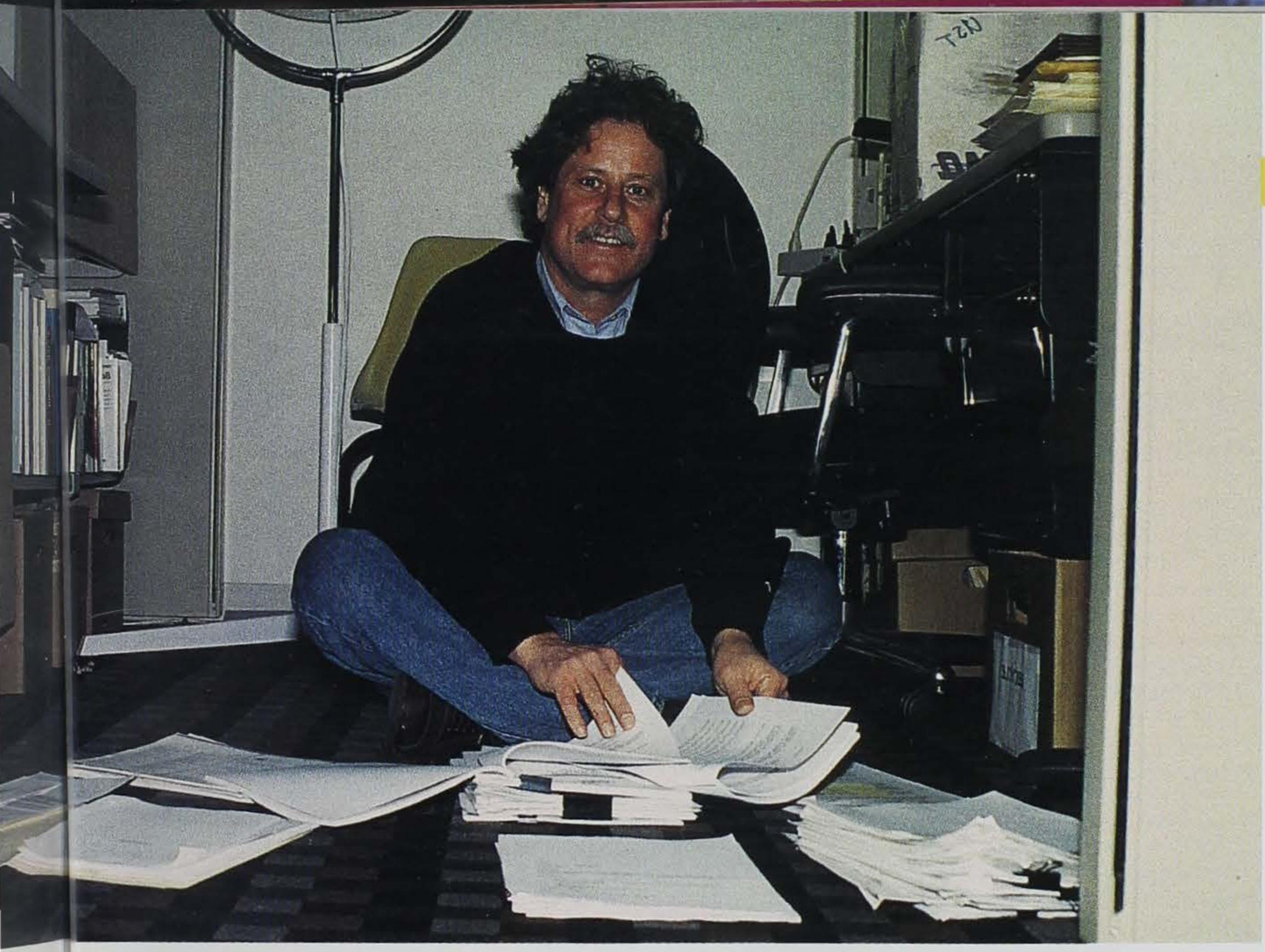
Not surprisingly, the bulk of the State's garbage is paper. But paper is not the only material recycled on the Capitol Complex in Des Moines. State employees also recycle aluminum cans, computer materials, construction and demolition waste, fluorescent tubes and ballasts, laser toner cartridges, metal and wire scrap, pallets, plastic containers and film, sawdust, telephone books, used oil and yard waste.

Many office items previously slated for the landfill are now stored as surplus property for agency reuse or resale at public auction. Office furniture and computer equipment are currently stored for reuse.

Iowans Below Average (in waste generation). In 1994, more than 45 percent of the nonhazardous solid waste generated by the Capitol Complex was diverted from Iowa landfills through recycling and reuse. The amount of waste generated in 1995 per Capitol Complex employee was 470 pounds. Of this total, 260 pounds/employee/year were landfilled and 210 pounds/employee/year were recycled. The waste generated per employee annually (470 pounds) at the complex is well below the average government agency waste generation rate of more than 1,000 pounds/employee/year.

The Department of General Services (DGS) and the Waste Management Assistance Division of the DNR have been working together since 1989 to implement and expand a complex-wide recycling program.

In 1995, the Waste Reduction Assistance Program (WRAP) of DNR conducted five waste assessments of the Capitol Complex. WRAP is designed to assist industry, business and government in reducing the amount and toxicity of wastes generated, thus protecting human health and the environment. The five WRAP assessments covered the following operational areas: waste reduction and recycling operations, buildings and grounds, utilities, vehicle dispatch, and printing. WRAP assessed the segregation, handling and collection of the current recycling program on the Capitol Complex and offered recommendations on improving recovery, efficiency and revenues or cost avoidance. The DGS



Casey L. Gradischnig

■ **"Clean-Out-Your-Files Day" during Earth Week 1996 helped promote recycling awareness among state employees.**

used the recommendations in the report to target recycling efforts for 1996 and beyond. As a result of WRAP assessments, the DGS has outsourced waste and recyclable hauling and plans to hire a full-time recycling coordinator for the Capitol Complex.

Since June 1995, the State of Iowa has outsourced waste and recyclable hauling to Artistic Solid Waste of Des Moines in an effort to save equipment maintenance and operating costs. Valuable human resources have been diverted to other critical tasks. With a new contract starting this year, Capitol Complex waste and recyclable hauling costs have been dramatically cut by 60 percent. Artistic Solid Waste hauls waste to Metro East Landfill, south of Mitchellville, and recyclables to Weyerhaeuser Recycling in Des Moines every day from the complex.

Paper, Paper and More Paper. Mixed office paper, computer printout paper (green-bar) and corrugated cardboard make up the bulk of waste materials generated on the complex. In 1995, almost 600 tons of mixed office

oes Around
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Harvesting the Urban Forest

by Brian Tormey

State employees in the Capital Complex are not the only ones who are recycling more types of paper than ever before (see accompanying story). It was not long ago when newsprint was the only discarded paper product accepted in most local recycling programs in Iowa. But now, it is not unusual to see old magazines, cardboard containers, cereal boxes and junk mail alongside newspapers in a recycling bin or drop-off box rather than the garbage can. Why the change?

Simply put, there has been a tremendous growth in recycled paper markets over the past few years. In fact, this change has been so dramatic the emphasis in this sector of the recycling industry has moved from market development to finding ways to increase the supply of recovered paper to satisfy market demand.

Recycling now plays a significant role in the manufacturing of new paper products. According to the American Forest & Paper Association, 80 percent of U.S. paper mills are designed to use some recycled paper, while about 200 mills nationwide depend solely on recycled paper. A large percentage of these mills were not in existence six years ago. Between 1990 and 1994, 85 new projects came on-line, and an additional 69 mills were scheduled to begin operations in 1995. As a result, recycled paper comprises 50 percent of the total fiber used by the paper industry in the U.S.

On the supply side, paper recycling has been very successful. While representing about 38 percent of the total municipal solid waste stream, paper accounted for more than 60 percent of the materials recovered in 1995. Nearly 64 percent of all corrugated cardboard containers produced in the United States are being recycled. In fact, corrugated cardboard is the single largest amount of material currently being recovered. Newspapers, the backbone of most residential recycling programs, are not far behind with a recovery rate of nearly 60 percent.

Given these numbers, it's easy to see we are approaching the maximum recovery of these grades of paper from the waste stream. Since many of the paper mills that have recently come on-line rely on these materials, the challenge facing the industry is to develop strategies to increase the supply of recovered paper to meet current and planned production capacity.

One method is to encourage local programs to find untapped sources of these materials. For example, the U.S. Environmental Protection Agency estimates 90 percent of the corrugated cardboard is generated from the businesses. It makes sense, therefore, that communities target this sector for additional recovery of cardboard. Industry trade groups, such as the Newspaper Association of America, the National Office Paper Recycling Project, and the American Forest & Paper Association, are conducting programs to inform local governments and businesses that the industry needs the paper collected through their recycling programs, and to promote the availability of markets for materials that, at present, may not be included in the collection mechanism.

As prices rise and supplies tighten for certain types of recycled paper, the technical ability of a mill to substitute a percentage of higher-grade paper with a lower quality grade has grown in importance. For example, some of the new mills producing cardboard containers can use mixed paper, such as junk mail, as a substitute for cardboard. Mills equipped with a new deinking process that has improved the efficiency of recycling old newsprint back into newspaper must add clay to the pulp recipe. Since clay is a component of the paper used in magazines, these mills can substitute this more readily available source for some of the newspaper used in the process. To meet these demands, many local recycling programs now accept mixed paper and magazines.

With greater dependence on recycled paper, paper companies are looking at ways to guarantee a dependable, long-term supply of this feedstock. Most paper companies relying on wood pulp as its fiber source either own or control their own woodlands. Similar management approaches are being considered to harvest the "urban forest."

One mechanism being used by paper mill owners is longer-term contracts with local governments and other entities involved in recycling collection. Three, five and even ten-year contracts are now being offered for almost all grades of paper. These contracts frequently contain a minimum guaranteed price to the supplier. Such arrangements provide a greater degree of stability to both local recycling programs and to the end-user.

As part of their strategic planning to increase supply, a number of paper companies are getting directly involved in the collection and intermediate processing network. This may be in the form of purchasing recycling processing facilities, or linking up with collectors and recycling processors through joint business ventures.

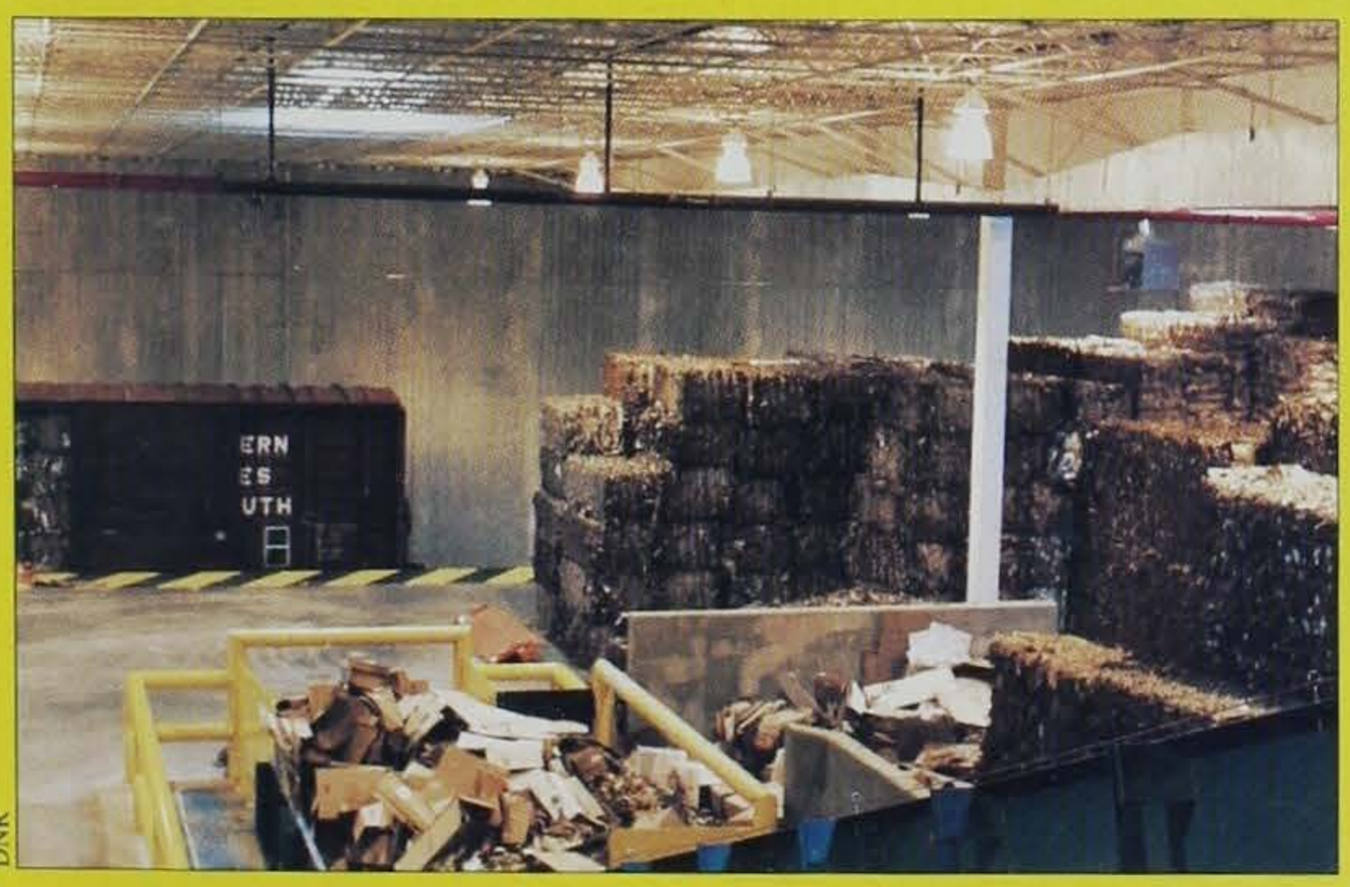
An Iowa firm, Cedar River Paper Company located in Cedar Rapids, has incorporated into its operation many of the strategies needed to compete in today's marketplace. This general partnership joint venture between

Weyerhauser Paper and Midwest Recycle, started operations in March 1995. About 750 tons per day of corrugating medium, the wavy inner layer of corrugated cardboard boxes, is produced from old cardboard and mixed paper. The ability to use up to 20 percent mixed paper is viewed by the company as a way to ensure a steady supply of feedstock that can be pulled from an area in close proximity to the mill. Many local recycling programs in central and eastern Iowa have already realized the benefits from this market for mixed paper.

With production capacity for recycled paper expected to grow even more over the next few years, the search for additional paper fiber sources in the "urban forest" will continue. Technological changes will allow even more paper discards to enter the recycling arena. For example, markets for polycoated paper products, such as juice boxes and milk cartons, and wax-coated cardboard are on the horizon. But perhaps the most crucial role in this endeavor will be played by us, the suppliers. Greater yields will result from the enrichment we provide by recycling at home and in the workplace.

Brian Tormey is an environmental specialist with the Waste Management Assistance Division in Des Moines.

■ Nearly 64 percent of all corrugated cardboard containers produced in the United States are being recycled. In fact, corrugated cardboard is the single largest amount of material currently being recovered. Newspapers, the backbone of most residential recycling programs, are not far behind with a recovery rate of nearly 60 percent.



DNR

paper, 32.5 tons of computer printouts paper and 48 tons of corrugated cardboard were recycled.

Because of demand from local paper mills (especially the new Cedar River Paper Company in Cedar Rapids), the complex office paper recycling program was expanded in late 1995 to include paper products never recycled before. State employees can now recycle soft and hard cover books, copy paper wrappers, blueprints, thermal fax paper and junk mail. It's now easier than ever to recycle.

State employees are also encouraged to use double-sided copying, electronic mail and other computer technologies to reduce the amount of paper generated.

Sorting It Out. In the last six months, state employees have been asked to separate computer printout paper from mixed office paper to increase material revenues. Computer printout paper is worth more than twice the value of mixed office paper. Agency areas that generate significant amounts of computer paper have been equipped with separate containers for collection.

Containers for newspaper recycling are also being purchased by DGS and will be placed at the front and back entrances of main buildings on the complex.

Every year state employees in Capitol Complex buildings partner with local telephone companies to recycle telephone books as new books arrive. In 1995, more than 5,500 books were collected for recycling, diverting 6,400 pounds (3.2 tons) of waste from the landfill.

Each month, a portion of the state's recycling profits are used to purchase new blue office paper recycling containers. As of January 1996, 1,800 containers have been distributed complex-wide. The WRAP waste assessment of recycling operations confirmed that better segregation of paper from waste was achieved by employees with blue recycling containers versus those employees without formally designated containers.

Clean-Out-Your-Files. In cooperation with the National Office Paper Recycling Project in Washington D.C., the DNR and DGS is sponsoring a complex-wide "Clean-Out-Your-Files Day" during Earth Week 1996. State employees will participate in this event to promote recycling awareness on the complex. The two state agencies are partnering with Artistic Solid Waste (waste/recyclable hauler), Weyerhaeuser Recycling (recycling vendor), Metro Waste Authority (local recycling and landfill agency) and Rockwell International of Cedar Rapids (a private industry that has conducted several facility events) to plan a successful event.

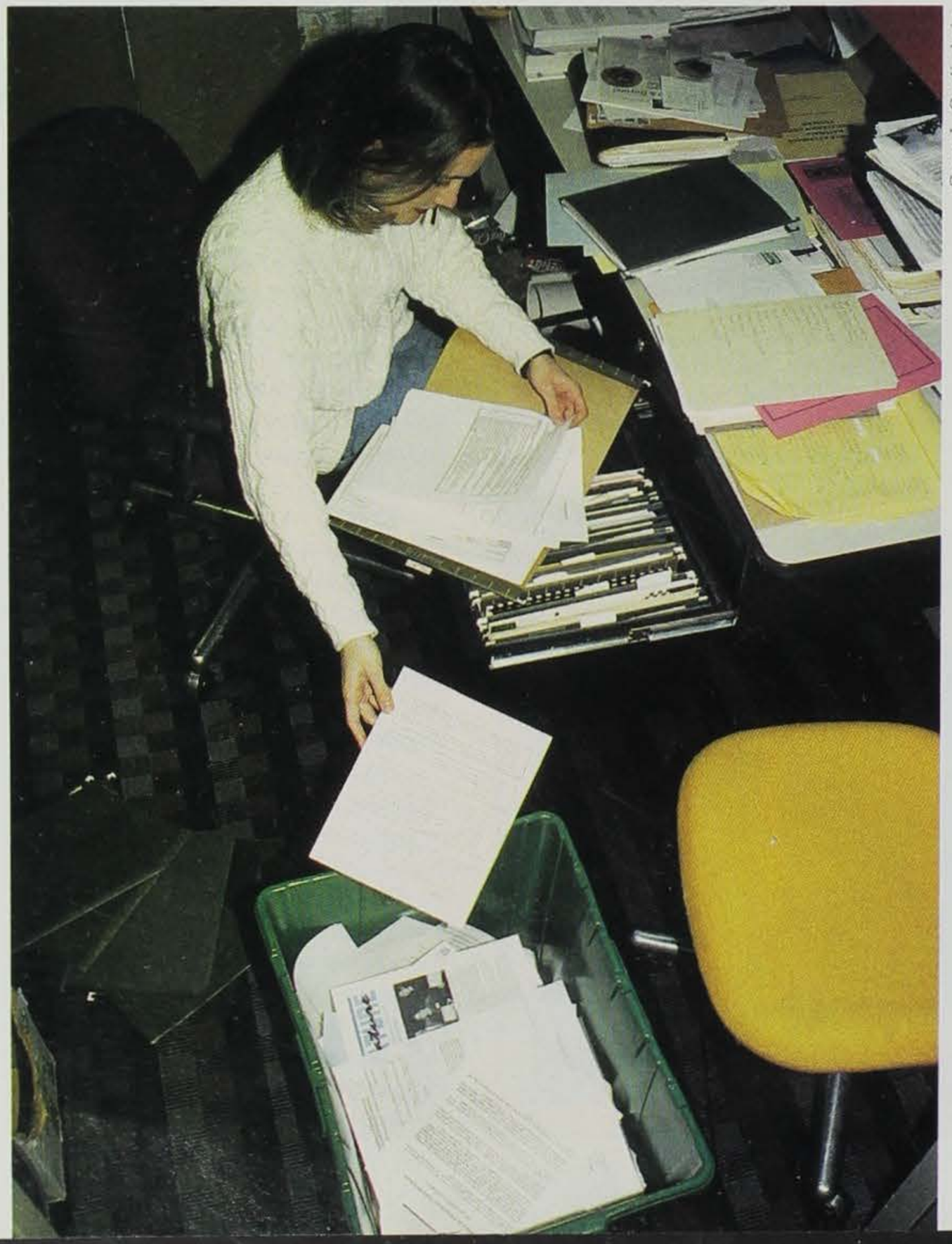
Closing the Loop. Collection of recyclables is only one part of the recycling process. In order for recycling collection programs to be successful, there must be stable end markets to use these materials. The DNR's waste management staff have also worked closely with the DGS purchasing staff to increase the amount and type of recycled content products available on state contract and purchased by state agencies. State agencies and eligible local governments can purchase office supplies, re-refined oil, carpeting and recycling containers with recycled content from the state contract.

Since 1994, a recycling coordinator has been assigned to each major state agency in the Capitol Complex. These 30 volunteers work with DGS and DNR staff to communicate recycling awareness and program changes to individual departmental staff. In August 1995, newsletter, *Second Time Around*, was published and distributed to recycling coordinators. Printed six times a year, the newsletter includes information on recycling and buy recycled efforts on the complex, waste reduction tips, and upcoming recycling events.

This network will be strengthened further when a full-time Capitol Complex recycling coordinator is hired this July. The recycling coordinator position will be funded through the DNR's waste management grant sources for the first year of operation and then through DGS recycling revenues.

For additional information on Capitol Complex recycling efforts, contact Tim Ryburn, DGS at 515/281-3137 or Beth Hicks, WMAD at 515/281-8672.

Elizabeth Hicks is an environmental specialist with the Waste Management Assistance Division in Des Moines.

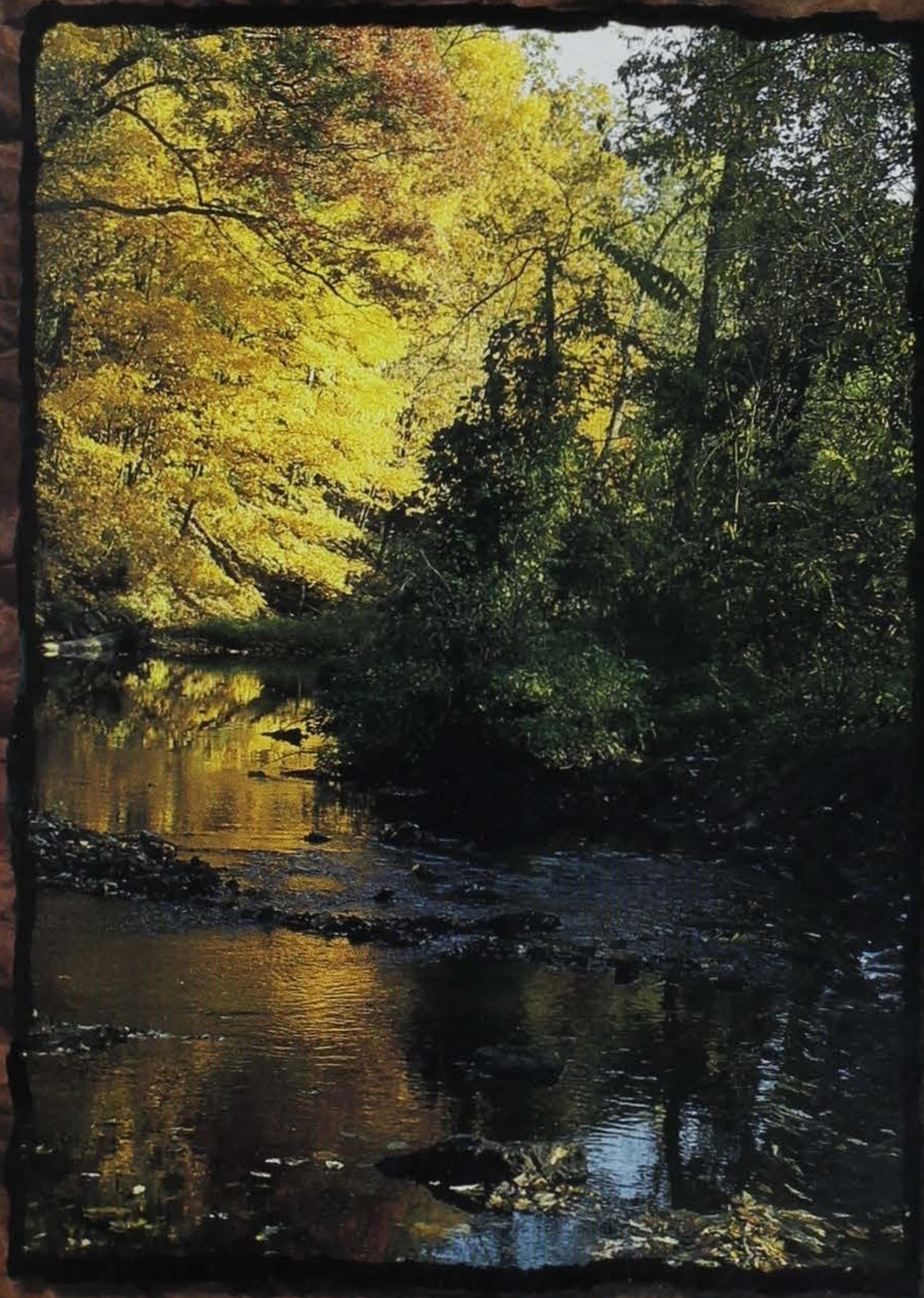


Casey L. Gradischnig

Casey L. Gradischnig

■ **Recycling has moved into the office. With the ability to use mixed paper, many recycled paper producers are looking for a steady supply of raw materials close at hand, long-term contracts with local governments and other entities may provide this stability.**

State Parks & Recreation Areas of Iowa



IOWA

Ambrose A. Call ◆ Backbone ◆ Badger Creek ◆ Beeds Lake ◆ Bellevue ◆ Big Creek ◆ Bixby ◆ Black Hawk ◆ Bobwhite

Welcome to the great heartland

Brush Creek Canyon ◆ Brushy Creek ◆ Cedar Rock ◆ Clear Lake ◆ Dolliver Memorial ◆ Elk Rock ◆ Emerson Bay ◆ Lighthouse

outdoors. From hiking and camping to

Fairport ◆ Fort Atkinson ◆ Fort Defiance ◆ Geode ◆ George Wyth Memorial ◆ Green Valley ◆ Gull Point ◆ Honey Creek

bird-watching and bicycling, each

Lacey-Keosauqua ◆ Lake Ahquabi ◆ Lake Anita ◆ Lake Darling ◆ Lake Keomah ◆ Lake Macbride ◆ Lake Manawa ◆ Lake

park in this guide offers outdoor

of Three Fires ◆ Lake Wapello ◆ Ledges ◆ Lewis and Clark ◆ Lower Gar ◆ McIntosh Woods ◆ Maquoketa Caves ◆ Marble

enthusiasts a multitude of diverse and

Beach ◆ Mines of Spain ◆ Mini-Wakan ◆ Nine Eagles ◆ Okamanpedan ◆ Palisades-Kepler ◆ Pikes Peak ◆ Pikes Point ◆ Pilot

exciting adventures. Rich in history

Knob ◆ Pleasant Creek ◆ Pine Lake ◆ Prairie Rose ◆ Preparation Canyon ◆ Red Haw ◆ Rice Lake ◆ Rock Creek ◆ Shimek

and natural resources, Iowa is a

Forest ◆ Springbrook ◆ Stephens Forest ◆ Stone ◆ Templar Park ◆ Trappers Bay ◆ Twin Lakes ◆ Union Grove ◆ Viking Lake

treasure chest of recreational

Volga River ◆ Walnut Woods ◆ Wanata ◆ Wapsipinicon ◆ Waubonsie ◆ Wildcat Den ◆ Wilson Island ◆ Yellow River Forest

e x c e l l e n c e.

Division Administrator: Mike Carrier ◆ Designer/Editor: Casey L. Gradischnig
Program Administration: Arnie Sohn ◆ Parks Publications: Angela Corio
Field Operations: Steve Pennington ◆ Iowa Department of Natural Resources Director: Larry J. Wilson

Pikes Peak

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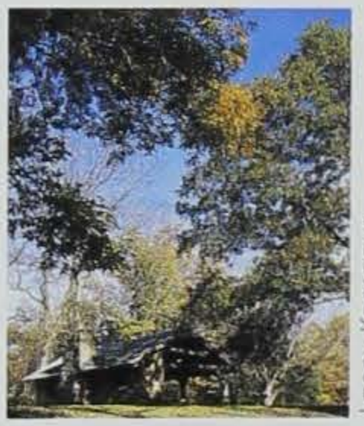
Camping

Iowa's state parks, recreation areas and forests offer enthusiasts 58 campgrounds with 5,700 campsites. Modern facilities (showers and flush toilets) are available at 42 campgrounds. Electrical hookups are available at 41 campgrounds. Camping is permitted only at designated campsites on a first-come, first-served basis. No reservations are accepted. Campers are required to register themselves. Designated "hike-in" campsites are available at Ledges, Presperation Canyon, Maquoketa Caves and Honey Creek. Campsites marked with the wheelchair sign are reserved for use by persons displaying a handicapped parking permit on their vehicle.

State Forest Camping

For a more rugged camping experience without modern rest rooms or showers, campgrounds are available at Yellow River, Stephens and Shimek state forests.



Lacey-Keosaqua

Rental Facilities

Cabins, group camps, enclosed shelters and open shelters may be reserved for a fee through the park ranger. All reservations must be made through the park ranger starting on the second business day after January 1.

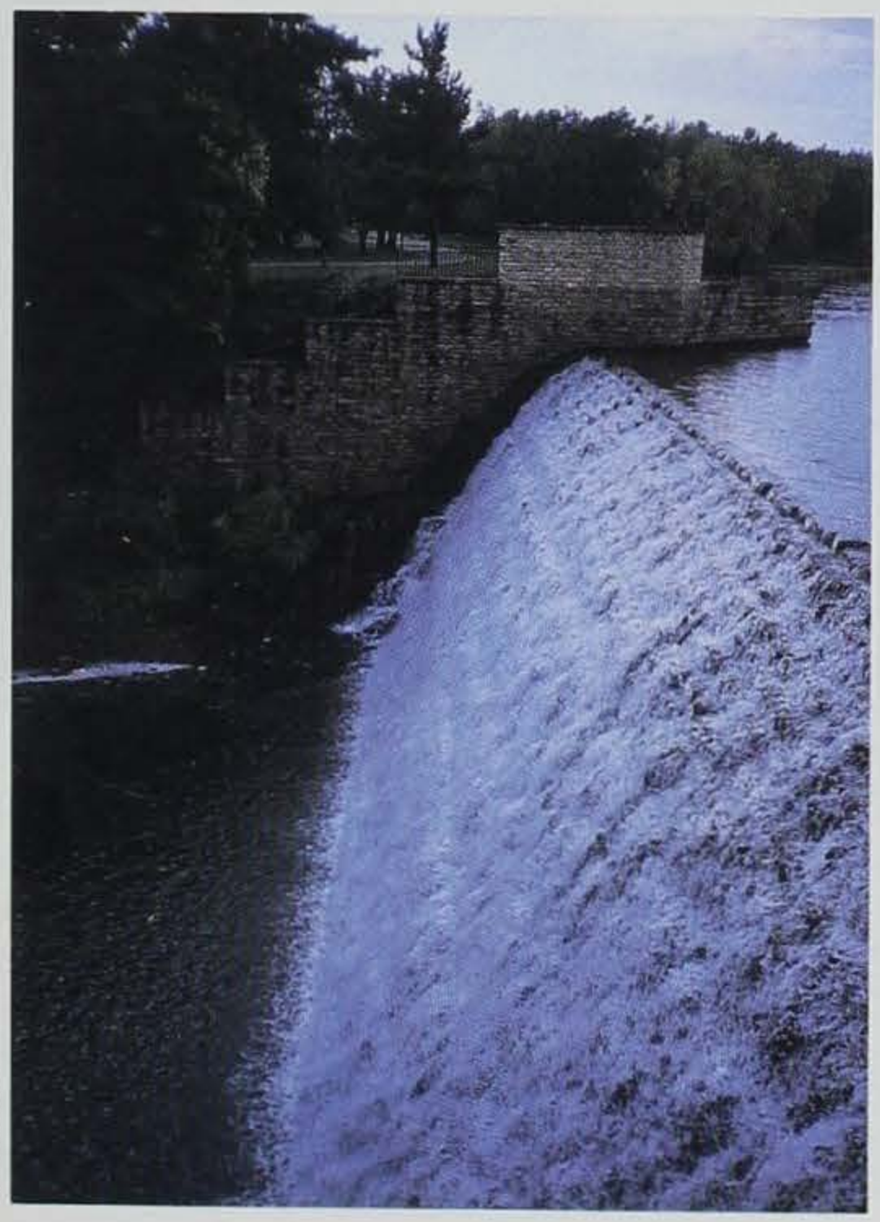
Pleasant Creek

Enclosed Shelters

A number of state parks contain beautiful enclosed shelters. The majority are stone and log structures constructed during the 1930s by the Civilian Conservation Corps (CCC) or the Works Progress Administration (WPA). All provide excellent settings for day-use group events. The facilities normally include kitchens, rest rooms and, in some instances, fireplaces. See parks chart for details and locations.

Organized Group Camps

Overnight group camping facilities are available on a rental basis at Dolliver and Springbrook state parks. Groups are provided complete lodging and dining accommodations including all dishes and cooking utensils as well as showers and rest rooms. Groups must bring their own bedding, towels and toiletry items. Special rates are available for organized youth groups. An organized group camping facility is also available at Lake Keomah State Park. Although there are no enclosed overnight accommodations, the area provides a scenic setting for daytime group events as well as overnight group tent or trailer use. The group camp building contains a complete kitchen, rest rooms and meeting space.



Beeds Lake

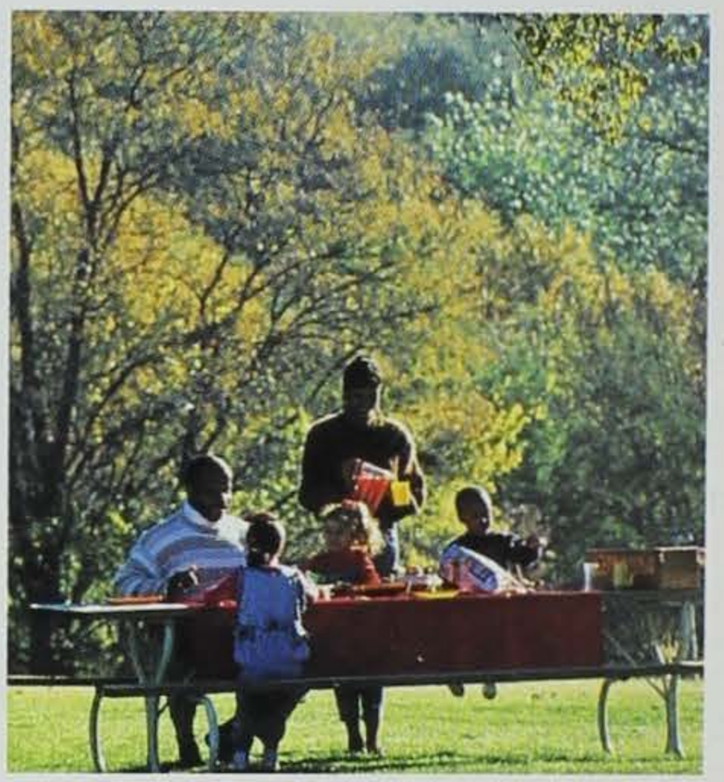
Gull Point

Cabins

Cabins are available at 10 state parks. Cabins accommodating up to eight people are available at Backbone and Lake Wapello. Lacey-Keosauqua, Lake of Three Fires, Palisades-Kepler, Pine Lake and Springbrook cabins accommodate four people. Included are kitchens with cooking utensils. Renters must provide their own bedding, towels, dishes and other camping items. The heated and air-conditioned cabins at Backbone and Pine Lake are available year round.

The rustic cabins at Pleasant Creek, Dolliver and Wilson Island are camping cabins which are smaller and without modern frills. Basic furnishings include a full-size sleeper couch, bunkbeds, table, chairs and an outdoor grill and picnic table. Cabin users should bring all items needed for camping. Overnight visitors can use the shower and rest room facilities located in nearby campgrounds.

Priority reservations for the handicapped-accessible cabins at Pine Lake, Pleasant Creek and Backbone will be accepted from October 1 through December 1 for the following year. This reservation period is only open to persons needing wheelchairs. All reservations are accepted for a stay of one week, with the week beginning and ending on Saturday.



Pikes Peak

Fishing

Fishing opportunities abound in state parks, from trout fishing in Backbone's trout streams, to walleye and yellow perch fishing in northwest Iowa's natural lakes. With opportunities like these, it's not surprising that 40 million fish are caught annually in the state making fishing the most popular participant sport in Iowa.

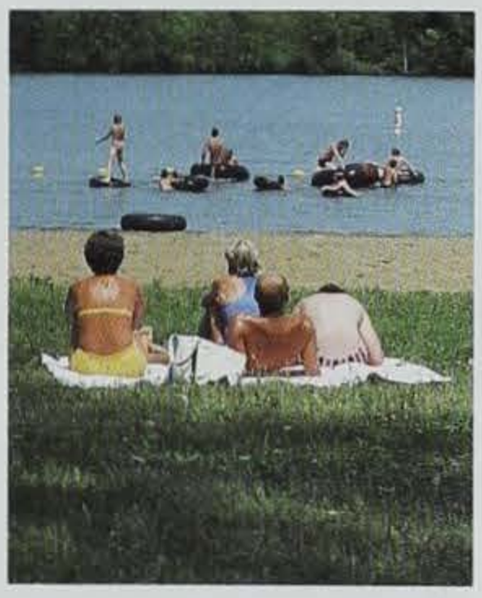
Boating

Experience the thrill of power boating and skiing at Lake Rathbun. Take a breeze-propelled sailboat trip at Big Creek or a scenic paddling adventure along the Iowa River through Pine Lake State Park. Whatever the preference, there are more than 9,000 miles of boatable rivers and streams, as well as more than 200 natural and artificial recreational lakes in Iowa. Most park concessionaires rent boats, canoes and pontoons. Motor size and speed regulations vary so check with the park ranger or contact the DNR for a boating regulations guide.

Picnicking

Open shelters, tables, grills or fire rings, and water are available in most picnic areas. Facilities are available on a first-come basis, although some may be reserved by contacting a ranger. Picnic sites marked with the wheelchair sign are reserved for persons displaying a handicapped parking permit on their vehicle.

Stephens State Forest



Swimming

Swimming opportunities are available in many state parks in designated beach areas only. Some offer life guards and a food concession. Check with park staff for more details.

Equestrian Facilities

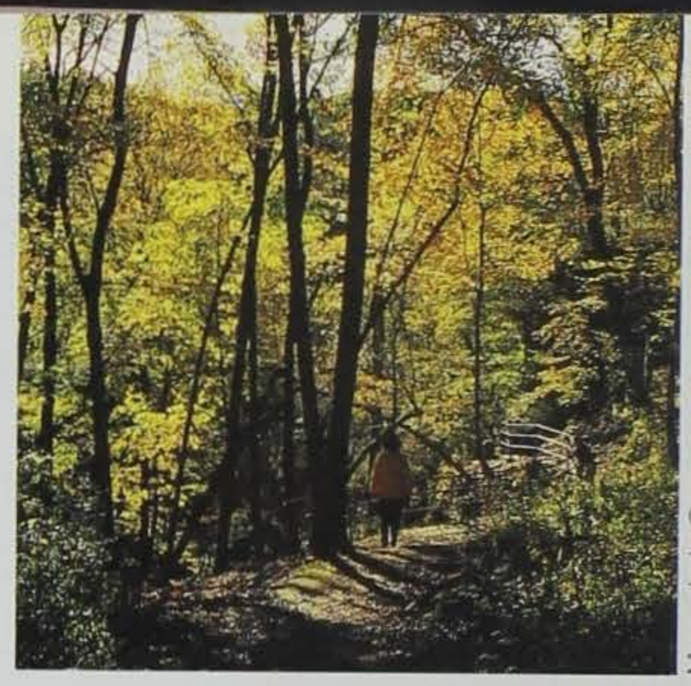
Horseback riding is a popular activity at a number of state parks, recreation areas and state forests. Equestrian camping opportunities and extensive trail systems are available at Waubonsie and Elk Rock state parks; Brushy Creek and Volga River state recreation areas; and Stephens, Shimek and Yellow River state forests. Horses may be ridden on all state park roadways and on trails designated for equestrian use. Stone State Park features 15 miles of equestrian trails but no equestrian campground. Trail riding booklets are available from the DNR.

Hunting/Shooting

Except in very limited special circumstances, the use of firearms or any other kind of weapon is prohibited in Iowa's state parks. However, portions of Volga River, Big Creek, Brushy Creek, Pleasant Creek, Badger Creek and Wilson Island are open for public hunting during regular open hunting seasons. Special regulations may apply, and hunters are urged to check with park rangers prior to their hunt. Big Creek also provides a concession-operated, state-of-the-art public shooting range for recreational shooting and sighting in of guns. A less formal, but safely designed range is available at Badger Creek, and others are planned at Volga River and Brushy Creek

Volkssport Trails

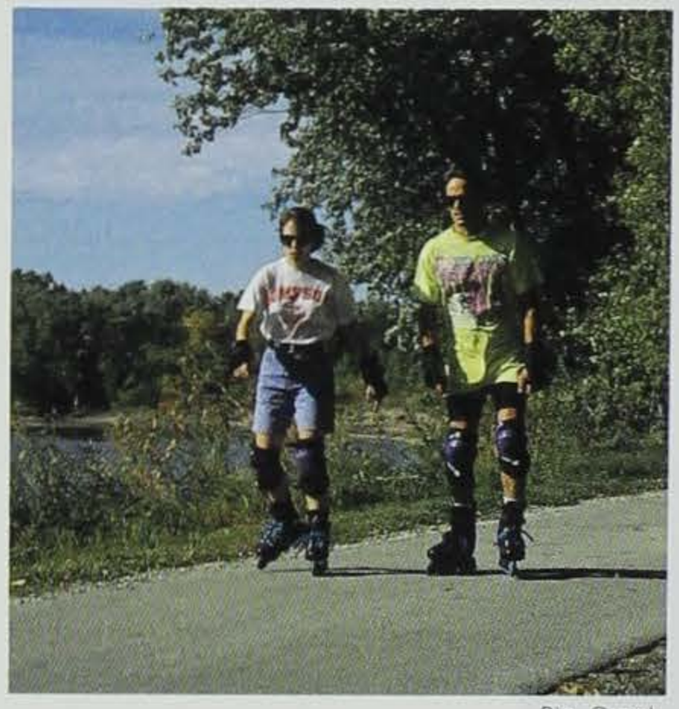
Volkssport hiking began in Germany during the 1960s to provide a noncompetitive physical activity for the whole family. This June marks the 20th anniversary of volkssporting in the U.S. with permanent trails in all 50 states. Anyone can participate. Volkssporting is a family-oriented activity and many parents carry infants in backpacks or push them in strollers. Volkssport trails are approximately 6 miles in length and have recently been established in six parks. Most of these seasonal trails are available from Memorial Day to Labor Day with some extended to October 31. See the facility chart for a listing. Detailed brochures are available from the DNR.



Maquoketa Caves

State Park Two-Wheel Treks

Ride from park to park for a weekend getaway or a week-long adventure. Four bike routes on paved county roads have been developed around the state to connect numerous parks and attractions. Gear shuttles are available for some routes. Detailed brochures are available from the DNR.



Big Creek

Trails

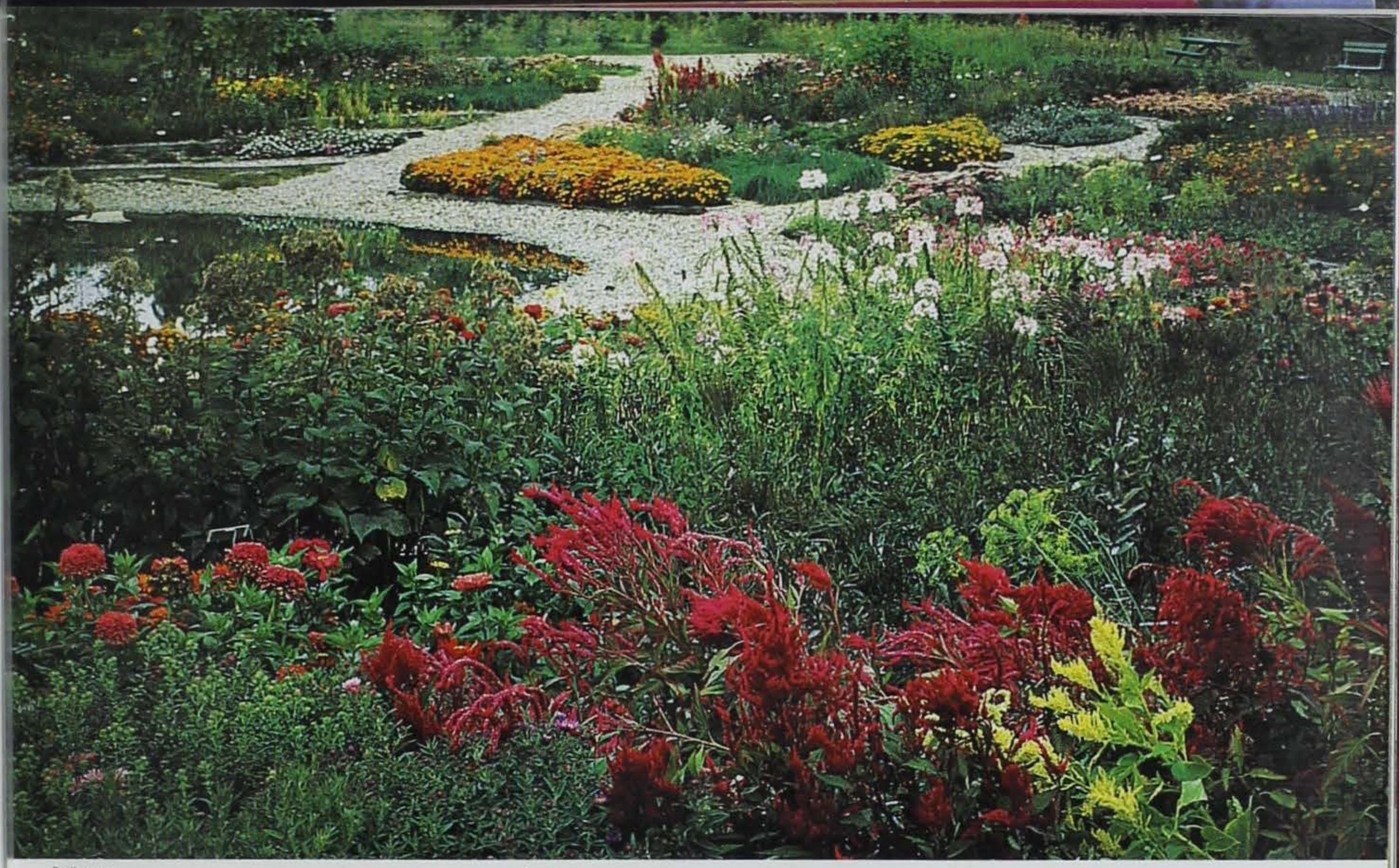
State park and recreation area trails offer many things to many people. They are the connection between people and places, providing a path to the unique features, scenic views and recreation facilities of an area. Trails have led families and friends to the "heart" of Iowa for generations. They have shown visitors Iowa's "places of quiet beauty" and enduring nature.

Trails provide access for visitors while ensuring user safety and resource protection. Iowa trails are used by hikers, walkers, people who use wheelchairs, as well as those using a variety of transportation forms including touring and mountain bikes, horses, roller skates, skateboards, cross-country skis, snowshoes, snowmobiles and dogsleds.

The Department of Natural Resources provides hundreds of miles of trails within state park and recreation areas. Of these, more than 400 miles are available to hikers, 250 miles to snowmobilers, 155 miles to horseback riders, 300 miles to cross country skiers, and 16 miles of hard surface trails specifically for cyclists with an additional 130 miles for mountain bikers.

Many state parks have self-guided nature trails. These include points of interest, species identification and site interpretation. Brochures are available at trail heads and park offices. Long distance backpacking trails challenge the physically fit and provide access to remote park areas. Fully accessible trails can be found in some areas.

Maquoketa Caves



Bellevue

Nature Centers/Museum

Two nature centers and a museum are operated by the Department of Natural Resources. The E.B. Lyons Nature Center is located in Dubuque at the Mines of Spain State Recreation Area. The center provides programs year round. Its displays, trails and the natural and historical features of the Mines of Spain provide a wide array of visitor opportunities.

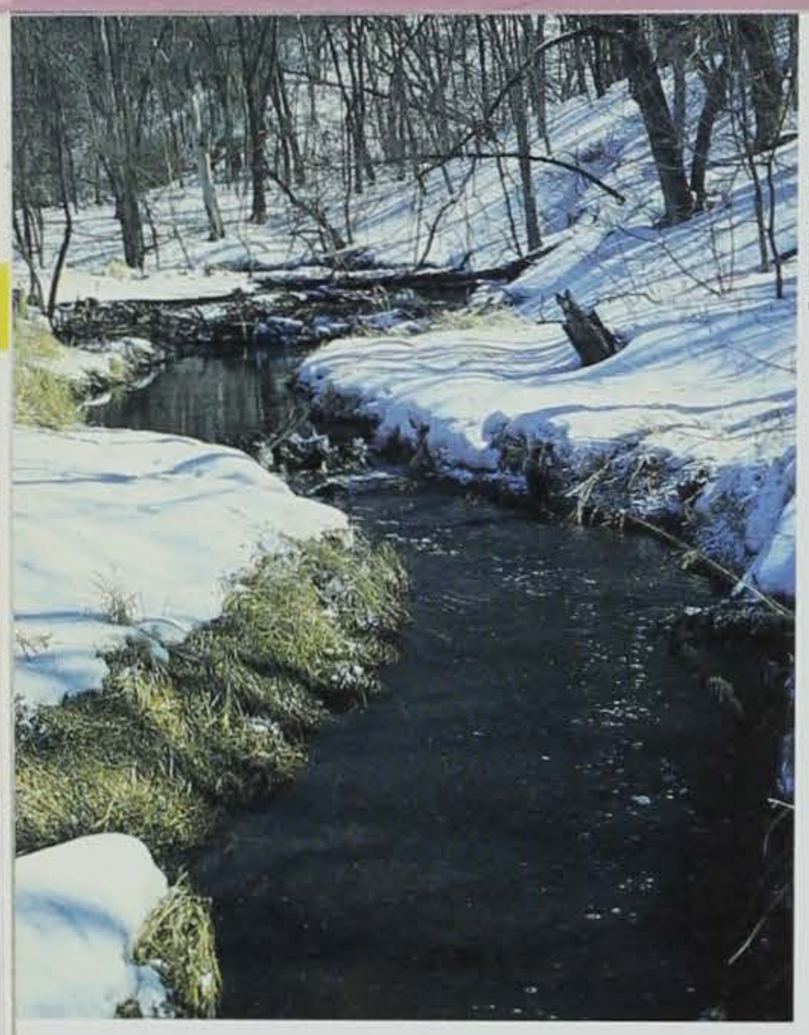
At Bellevue State Park's Nelson Unit, just south of Bellevue, the South Bluff Nature Center is open seasonally and for groups by request. The center has outstanding displays. The nearby one-acre Garden Sanctuary for Butterflies is designed specifically to provide habitat for a variety of butterflies and is unique to the Midwest. More than 150 individual plots contain plants which provide food and shelter for butterflies as well as beautiful viewing for visitors.

The Loess Ridge Nature Center tells the story of the geology, plants and animals of the loess hills region of western Iowa. Located in Stone Park, the center is open year round and operated by the Woodbury County Conservation Board.

The Civilian Conservation Corps (CCC) museum at historic Backbone State Park in Delaware County tells the story of the CCC in Iowa. The museum is open seasonally and for groups by request.

Harvesting Edible Plants

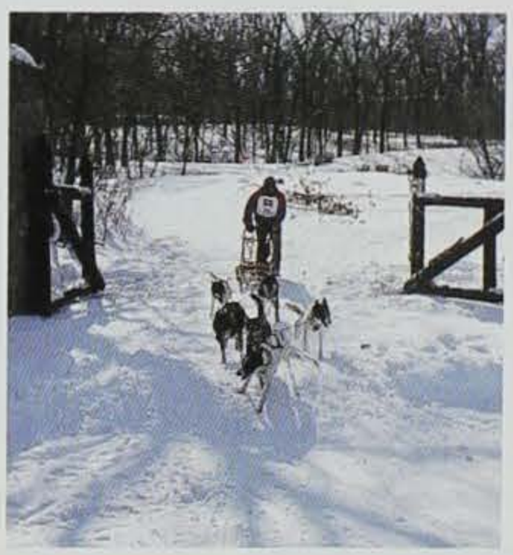
Mushrooms and asparagus may be harvested in all state parks, recreation areas and forests. Nuts, fruits and berries may be gathered unless posted otherwise. American ginseng may not be harvested in state parks or preserves.



Springbrook

Winter Sports

Iowa's state parks and recreation areas offer a variety of winter recreational opportunities. Popular winter activities include cross-country skiing, sledding, ice skating, snowshoeing, ice fishing, nature study and snowmobiling. Snowmobiliers should contact park personnel for information regarding snowmobile trail locations and weather conditions. Honey Creek State Park on Lake Rathbun features a heated rest room with showers for winter camping comfort.



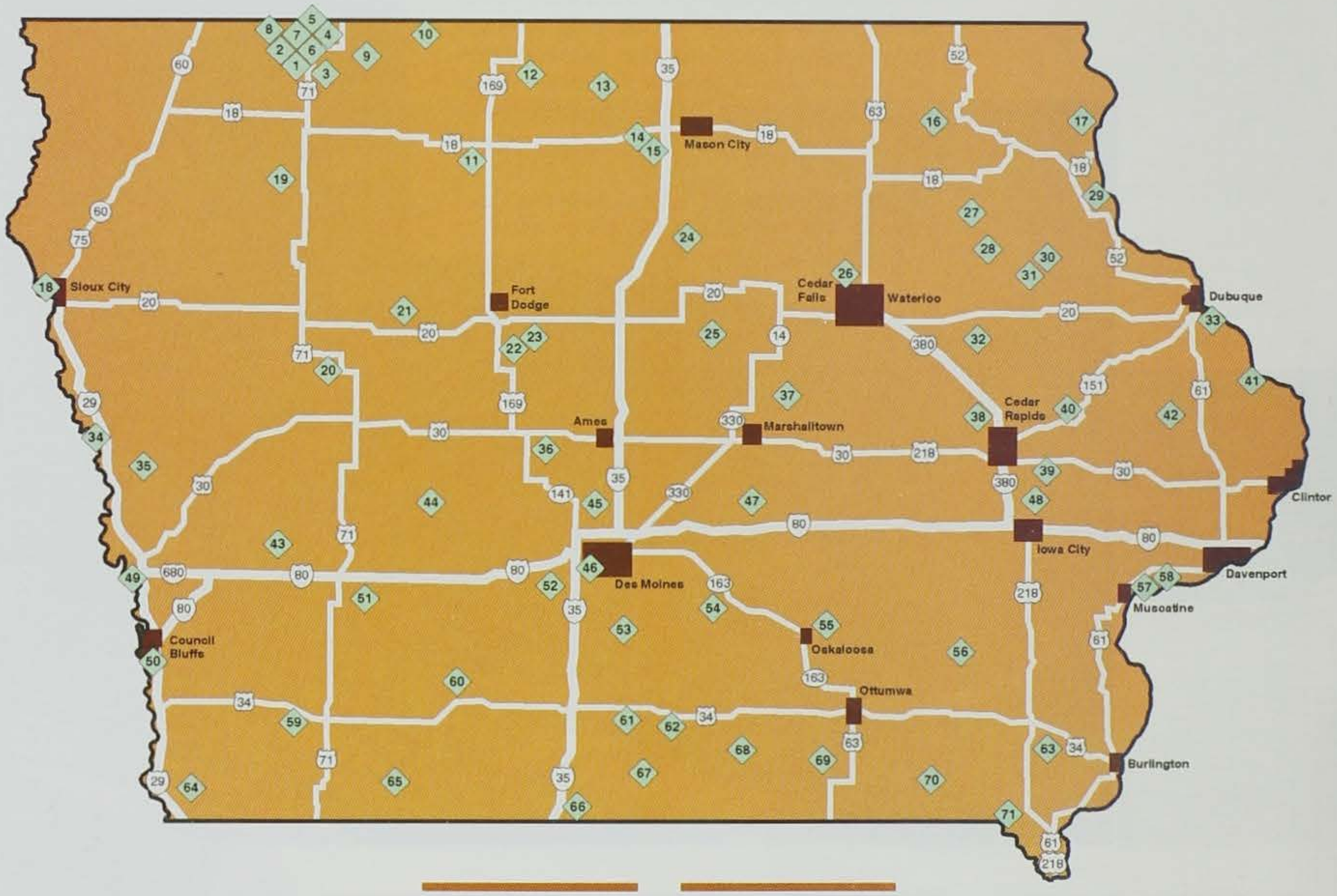
Palisades Kelper

Special Winter Events

Special events are not just limited to summer and fall. Special winter events such as McIntosh Woods Winterfest, Pilot Knob Dog Sled Race and ice fishing tournaments at Big Creek and Pleasant Creek are held every year. These events often include such varied activities as snowmobling and cross-country skiing contests as well as winter hiking snowshoeing and sledding.

A closer look at

State Parks & Recreation Areas of Iowa



For more information

Current rate, park regulation and individual park brochures are available free of charge at most state parks or by calling the DNR's 24-hour information system at 515-281-TENT and following the instructions to request publications. Specific publications regarding canoeing, boating, fishing, snowmobiling, hiking, biking, trail riding and hunting are also available from the DNR. Either call, visit or write the DNR's central office in the Wallace Building, 900 E. Grand Ave. in Des Moines, IA 50319-0034

Regulations

Visitors to Iowa's parks, forests and recreation areas are asked to swim only in designated areas and to use only fire rings or grills for fires. Please do not bring glass containers or pets onto beach areas. Pets are, however, allowed in other recreation areas provided they are leashed. And finally, visitors to Iowa's state parks and recreation areas are asked to carry out their trash from most day-use areas. Receptacles are available at campgrounds, lodges, cabins and supervised beach areas.

A larger size version of the text is available by calling the DNR at 515-281-5145 (TTY/TDD number 515-242-5967) or by writing the DNR at 900 E. Grand, Des Moines, IA 50319-0034

For specific locations of these parks, look for this symbol on Iowa Department Of Transportation road maps.

Items appearing in burgandy indicate facilities accessible to the mobility impaired. Fully accessible campsites may not be available. Contact park for details.

			Map Location Number	Area Acreage	Camping (M) Modern (N) Non-Modern	(E) Equestrian (G) Group (H) Hike-In	Campsites - Electric	Campsites - Nonelectric	Trailer Dump Station	(S) Seasonal (Y) Year Round	Cabin Rental	Enclosed Shelter Rental	Open Picnic Shelter Rental	Interpretive Trail	Volksport Trail (S) Seasonal (E) Events	Trails - (H) Hiking	(E) Equestrian (B) Bicycle	Swimming	Fishing (S) Stream (L) Lake	(R) Federal Reservoir (A) Artificial	Fishing Pier (P) Pier (J) Jetty	Lake Acreage (N) Natural	Boat Rental	Boat Ramp	Hunting	Playgrounds
Ambrose A. Call	515-581-4835	1-1/2 Mi. S.W. Algona	11	130	N	13	3					●	●	●		H			●						●
Backbone	319-924-2527	4 Mi. S.W. Strawberry Point IA 410	31	1780	N-M	23	150	●		Y-S			●	●		H		S	●		L-S		85A	●	●		●
Badger Creek Rec. Area	515-285-4502	6 Mi. S.E. Van Meter	52	1162																	L		276A		●	●	
Beeds Lake	515-456-2047	3 Mi. N.W. Hampton-Co. Rd.	24	319	M	70	74	●					●	●		H			●		L	J	99A	●	●		
Bellevue	319-872-4019	2-1/2 Mi. S.Bellevue-U.S. 52	41	547	M	23	29	●			●		●	●		H			●		S			●	●		●
Big Creek	515-984-6473	2 Mi. N. Polk City-IA. 415	45	1536									●			H-B	S		●		L	JP	905A	●	●		●
Bixby	319-924-2527	5 Mi. N. Edgewood	30	184	Rugged woodland with stream, ice cave and trails																						
Black Hawk	712-657-8712	Lake View-IA 175 & 71	20	86	M	68	108	●					●	●		H			●		L	P	925N	●	●		●
Bobwhite	515-873-4670	1 Mi. W. Allerton-IA.40	67	398	N	19	13						●	●		H			●		L		89A		●		
Brush Creek Canyon	319-425-4161	2 Mi. N. Arlington	28	217	Forested steep wooded terain with diversity of habitats, flora and fauna.																						
Brushy Creek Rec. Area	515-359-2501	4 Mi. S. Duncombe, Co. Rd. P-73	23	6500	N-E	50	75									H-E	E				S					●	
Cedar Rock	319-934-3572	3 Mi. N.W. Quasqueton	32	400	Residence designed by Frank Lloyd Wright. Visitor Center																						
Clear Lake	515-357-4212	2 Mi. S. Clear Lake-IA. 106	15	55	M	95	120	●			●	●				B			●		L		3684N	●	●		●
Dolliver Memorial	515-359-2539	3 Mi. N.W. Lehigh-IA.50	22	600	M-G	28	13	●		S	●			●		H		E			S				●		●
Elk Rock (Red Rock)	515-842-6008	7 Mi. N. Knoxville-IA. 14	54	2218	M-E	32	60	●				●	●	●		H-E					L		10600R	●			
Emerson Bay & Lighthouse	712-337-3211	2-1/2 Mi. N. Milford-IA.86	1	12	M	60	57	●					●						●		L		3847N		●	●	●
Fairport	319-263-3197	5 Mi. E. Muscatine-IA.22	57	17	M	43		●					●								S				●		
Fort Atkinson	319-425-4161	Adjoins Ft. Atkinson-IA. 24	16	5	Reconstructed fort built in 1840. Museum open seasonally.																						
Fort Defiance	712-337-3211	1 Mi. W. Estherville-IA.9	9	181	N	8	24				●					H-E											
Geode	319-392-4601	4 Mi. S.W. Danville-Co. Rd.	63	1641	M	96	89	●				●	●			H			●		L		200A	●	●		●
George Wyth Memorial	319-232-5505	Waterloo/Cedar Falls - IA. 218	26	1094	M	38	20	●			●	●	●			H-B			●		L-S	P	300A	●	●		●
Green Valley	515-782-5131	2-1/2 Mi. N.W. Creston-IA. 186	60	1000	M	81	58	●				●	●			H			●		L	JP	428A		●		
Gull Point	712-337-3211	3-1/2 Mi. N. Milford-IA. 86	2	165	M	60	52	●			●		●	●		H			●		L		3847N		●		●
Honey Creek (Rathbun)	515-724-3739	9-1/2 Mi. W. 3-1/2 Mi. S.E. Moravia - -Hwy. 142	68	828	M	94	59	●				●	●			H			●		L		11000R	●			
Lacey-Keosauqua	319-293-3502	Adjoins Keosauqua-IA. 1	70	1653	M	45	68	●		S	●		●			H			●		L-S		22A	●	●		
Lake Ahquabi	515-961-7101	5-1/2 Mi. S.W. Indianola-IA. 349	53	114	M	85	76	●			●	●	●			H-B		S	●		L	JP	114A	●	●		●
Lake Anita	712-762-3564	5 Mi. S. Anita Interchange-I-80	51	942	M	75	75	●				●	●					E	●		L	J	182A		●		●
Lake Darling	319-694-2323	3 Mi. W. Brighton-IA. 78 & 1	56	1387	M	81	37	●				●	●			H			●		L	J	299A	●	●	●	
Lake Keomah	515-673-6975	5 Mi. E. Oskaloosa-IA. 371	55	366	M-G	52	36	●			●	●	●			H			●		L	JJ	84A		●		
Lake Macbride	319-644-2200	4 Mi. W. Solon-IA. 382	48	2180	N-M	40	82	●				●	●			H		S	●		L	J	812A	●	●		
Lake Manawa	712-366-0220	1 Mi. S. IA. 92-Council Bluffs	50	1529	M	35	33	●				●				B			●		L	P	660N	●	●		
Lake of Three Fires	712-523-2700	3 Mi. N.E. Bedford-IA. 49	65	694	M	30	82	●		S		●	●			H-E		E	●		L		85A		●		
Lake Wapello	515-722-3371	6 Mi. W. Drakesville-IA. 273	69	1168	M	44	40	●		S		●	●			H			●		L	JP	289A		●		●
Ledges	515-432-1852	6 Mi. S. Boone-IA. 164	36	1200	M-H	40	54	●				●	●			H					S						●
Lewis and Clark	712-423-2829	3 Mi. W. Onawa-IA. 175	34	176	M	81		●			●		●	●		H		E	●		L		250N		●		●
Lower Gar Access	712-337-3211	1/2 Mi. S.E. Arnolds Park-U.S. 71	3	7									●								L		273N		●		
McIntosh Woods	515-829-3847	3/4 Mi. E. Ventura-U.S. 18	14	62	M	45	4	●						●		H			●		L	J	3684N	●	●		●
Maquoketa Caves	319-652-5833	7 Mi. N.W. Maquoketa-IA. 428	42	272	M-H	18	10	●				●	●			H		E									●
Marble Beach	712-337-3211	2 Mi. N.W. Orleans-IA. 276	4	64	M	103	121	●											●		L		4169N		●	●	
Mines of Spain & E.B. Lyons Nature Center	319-556-0620	S. Edge of Dubuque From U.S. 52	33	1380	Undeveloped area rich in natural and historic significance. Nature Center								●	H		H										●	
Mini-Wakan	712-337-3211	N. Shore Spirit Lake	5	20									●						●		L	P	4169N		●		
Nine Eagles	515-442-2855	6 Mi. S.E. Davis City-Co. Rd	66	1119	M	46	54	●								H-E		E	●		L		67A		●		
Okamanpedan	712-362-2078	3 Mi. N.E. Dolliver-Co. Rd.	10	19									●						●		L		981N		●		
Palisades-Kepler	319-895-6039	3-1/2 Mi. W. Mt. Vernon-U.S. 30	39	603	M	45	31	●		S	●		●	●		H					S				●		
Pikes Peak	319-873-2341	3 Mi. S.E. McGregor-IA. 340	29	970	M	60	20	●					●			H		S									●
Pikes Point	712-337-3211	2-1/2 Mi. S.W. Spirit Lake-IA. 9	6	15									●						●		L		3847N				●
Pilot Knob	515-581-4835	4 Mi. E. Forest City-IA. 9	13	700	M	48	12	●					●			H-E					L		15A				●
Pleasant Creek	319-436-7716	4 Mi. N. 1/2 Mi. W. Palo	38	1927	M-E	41	28	●		S		●	●			H-E			●		L		410A	●	●	●	●
Pine Lake	515-858-5832	1/2 Mi. N.E. Eldora Co. Rd. 556	25	572	M	76	52	●		Y	●	●	●			H			●		L	J	69-50A	●	●		
Prairie Rose	712-773-2701	6 Mi. S.E. Harlan	43	661	M	61		●				●	●			H			●		L		204A		●		
Preparation Canyon	712-423-2829	5 Mi. S.W. Moorhead-IA. 183	35	344	H		8						●			H											
Red Haw	515-774-5632	1 Mi. E. Chariton-U.S. 34	62	420	M	60	20	●				●	●			H			●		L		72A	●	●		●
Rice Lake	515-581-4835	2-1/2 Mi. S.E. Lake Mills-Co. Rd.	12	47									●			H			●		L		612N		●		
Rock Creek	515-236-3722	6 Mi. N.E. Kellogg-Co. Rd	47	1697	M	44	200	●					●			H			●		L	J	602A	●	●		●
Shimek Forest Camp	319-878-3811	1 Mi. E. Farmington-IA. 2	71		N-E		38									H-E					L		20A		●	●	
Springbrook	515-747-3591	8 Mi. N.E. Guthrie Center, Hwys. 25 & 384	44	786	M-G	55	145	●		S		●	●			H		E	●		L	J	16A		●		●
Stephens Forest Camp	515-774-5632	W. Lucas, E. Chariton-U.S. 65-34	61		N-E		80						●	●		H-E					L		10A			●	
Stone	712-255-4698	8 Mi. N.W. Sioux City-IA. 12	18	1069	M	9	23				●					H-E		E			L-S		12A				
Templar Park Rec. Area	319-337-3211	3 Mi. N.W. Spirit Lake-IA. 276	7	10									●						●		L		4169N		●		
Trappers Bay	712-337-3211	Adjoins Lake Park-IA 219	8	57															●		L		1041N				
Twin Lakes	712-657-8712	7-1/2 Mi. N. Rockwell City-IA. 4-124	21	15									●						●		L		569N		●		●
Union Grove	515-473-2556	4 Mi. S.W. Gladbrook-Co. Rd.	37	172	N	15	17						●			H			●		L	J	110A		●		
Viking Lake	712-829-2235	4 Mi. S.E. Stanton-Co. Rd.	59	1000	M	88	42	●				●	●			H			●		L		137A	●	●		●
Volga River Rec. Area	319-425-4161	4 Mi. N. Fayette-IA 150	27	5422	N E		42							●		H-E					L-S		135A		●	●	
Walnut Woods	515-285-4502	4 Mi. S.W. Des Moines-IA. 5	46	300	N	8	20				●					H-E					S				●		
Wanata	712-337-3211	1/2 Mi. S. Peterson-IA. 10	19	160												H					S						
Wapsipinicon	319-462-2761	Adjoins Anamosa-E 34	40	390	M	15	15				●	●	●			H					S				●	●	
Waubonsie	712-382-2786	7 Mi. S.W. Sidney-IA. 239-2	64	1247	M-E	22	73	●				●	●			H-E											
Wildcat Den	319-263-4337	10 Mi. E. Muscatine-IA. 22	58	417	N		28					●	●			H					S						
Wilson Island Rec. Area	712-642-2069	5 Mi. W. Loveland-IA.362	49	577	N-M	65	73	●		S		●	●			H		E			S					●	●
Yellow River Forest Camp	319-586-2548	14 Mi. S.E. Waukon-IA.	17	76	N E		176									H-E					S			●	●	●	

Federal regulations prohibit discrimination on the basis of race, color, national origin, sex or disability. If you believe that you have been discriminated against in any program, activity, or facility mentioned in this publication, please write to: Director, Iowa Department of Natural Resources, Wallace State Office Building, 900 E. Grand Ave., Des Moines, IA 50319-0034

Nature's finest

Whether strolling under the natural bridge or exploring the subterranean wonders at Maquoketa Caves State Park, Iowa's majestic natural beauty is impressively boundless. A peaceful picnic at Steele Prairie Preserve amongst the wildflowers, a hike-in overnight camping expedition with the family at Ledges State Park -- or how about a fishing trip floating atop the reflective waters of Beeds Lake -- the possibilities are endless NATURALLY!

Playgrounds

Parks are for kids of all ages. Play on the huge wooden play structures at Big Creek and Lake Manawa beaches or enjoy any of the 30 other play structures located in state parks throughout Iowa.

Pikes Peak

Big Creek

Accessible Park Facilities

A primary DNR goal is making campgrounds, picnic shelters, cabins, overlooks, fishing jetties, trails and other facilities accessible to everyone. Check the parks chart for a listing of facilities accessible to the mobility impaired. Open picnic sites and camp sites marked with the wheelchair sign are reserved for persons displaying a handicapped parking permit on their vehicle.

Pikes Peak

Fort Atkinson

A Look Back

Many state parks have historic significance. Ancient human evidence in the form of earthen ceremonial and burial mounds can be found in several state parks. Native Americans roamed and lived in places such as Maquoketa Caves, Pikes Peak, Ledges and Lacey-Keosauqua state parks. And some state parks have ties to more recent European settlement.

Fort Atkinson Rendezvous

The annual rendezvous has been held during the last full weekend of September at Ft. Atkinson State Preserve in northeast Iowa since 1977. The event recreates life on the 1840s Iowa frontier with authentic buckskinners, U.S. Army dragoons, black powder shoots, craftspeople, contests, movies and demonstrations.

Forest Crafts Festival

Held at Lacey-Keosauqua State Park the second weekend of October, the festival features woodcraft demonstrations and sales, forest and wildlife management demonstrations and buckskinners. Nearby Keosauqua has a parade, carnival and other related events.

Lewis and Clark Festival

In 1984, the first annual Lewis and Clark Festival was held at Lewis and Clark State Park near Onawa, the site of an1804 Lewis and Clark encampment. The June festival features movies about the 1804 expedition, buckskinners in frontier dress, bluegrass music and events such as a fishing contest and "fun run." A major attraction is the full-sized replica of Lewis and Clark's keelboat, *Discovery*, constructed by local volunteers and park staff.

State Preserves System

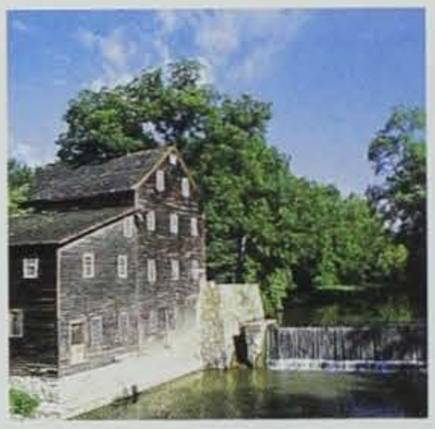
There have been many changes to Iowa's plant and animal communities in the last 150 years. Of the millions of acres of prairie which once covered Iowa, less than one percent remains. Animal species such as bison, elk and the gray wolf were eliminated by the early 1870s. Whooping cranes disappeared by the turn of the century while prairie chickens last nested in northwest Iowa in the 1930s.

The state preserve system was established in 1965 to protect areas of our natural, prehistoric and historic heritage for present and future generations. Preserve designation provides an area with the highest form of protection the State of Iowa offers. Currently, there are 87 state preserves known for their archeological, geological, biological, historical or scenic resources. Visit any of Iowa's preserves and take a step "back in time." A directory of state preserves is available from the DNR.

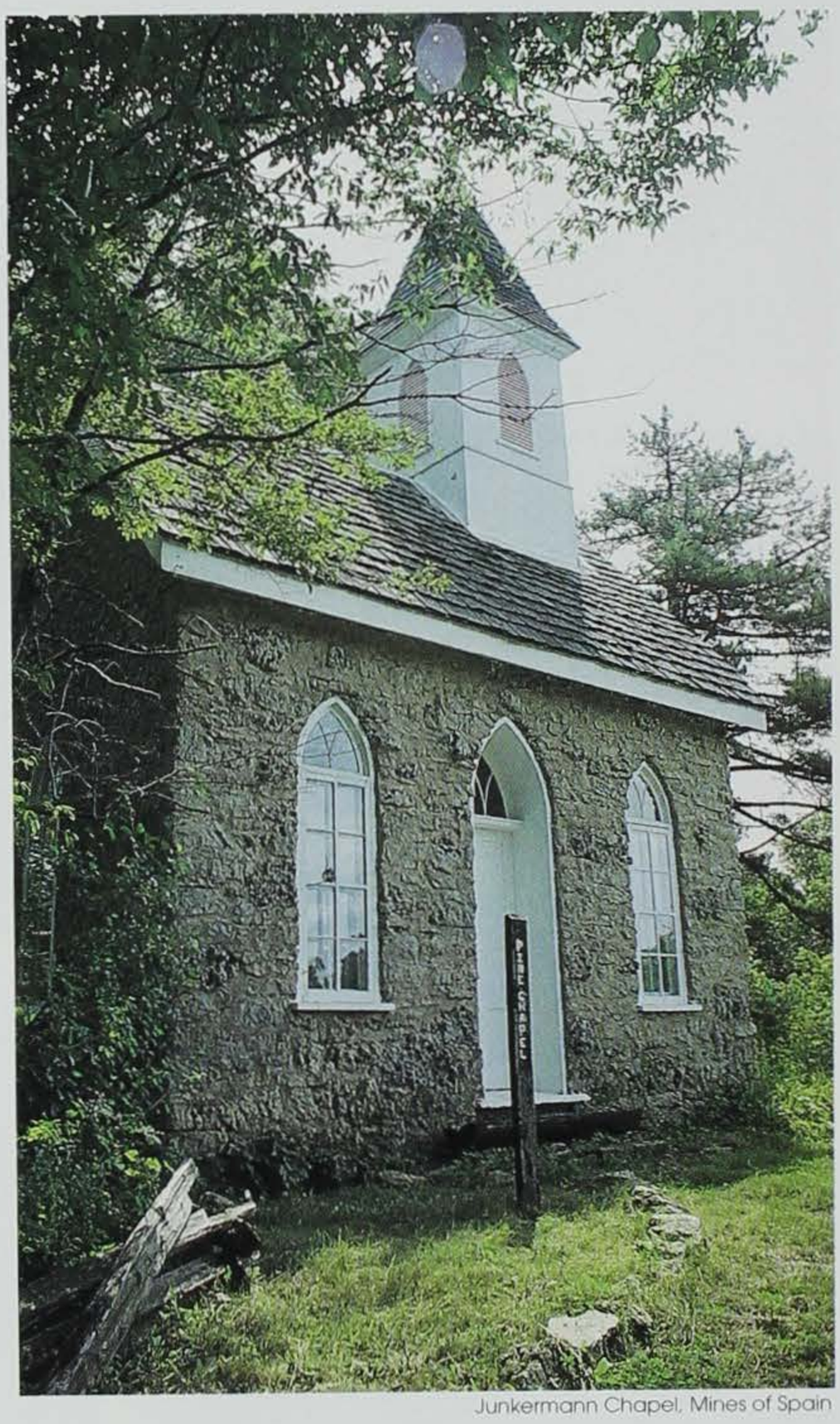
Steele Prairie State Preserve

Pine Creek Grist Mill

Pine Creek Grist Mill at Wildcat Den State Park was built in 1858 and is one of the finest examples of mid-nineteenth century mills left in the country.



Pine Creek Grist Mill



Junkermann Chapel, Mines of Spain

Jullien Dubuque Monument

Mines of Spain

Rich in history and natural resources, the 1,380-acre Mines of Spain Recreation Area includes abundant evidence of prehistoric Indian occupation such as burial mounds and rock shelters; a memorial to European settler Julien Dubuque; the E.B. Lyons Nature Center; and numerous stone buildings dating back to the 1800s.

Pine Creek Grist Mill

Julien Dubuque Monument

Cedar Rock

Cedar Rock

Cedar Rock is a Frank Lloyd Wright-designed residence on the Wapsipinicon River near Quasqueton in Buchanan County. Designed by the famed architect in the late 1940s, it is an excellent example of Wright's "Usonian" style of architecture. Wright not only designed the home, but also its interior furnishings. The home and grounds were given to the state in 1981 by its original owners, Mr. and Mrs. Lowell Walter. The residence, grounds and visitor center are open for public tours May through October, 11 a.m. to 5 p.m. Tuesday through Sunday. Cedar Rock is closed Mondays. Group tours are available on request.

Cedar Rock

Other State, Federal and County Areas

Historic Properties

The State Historical Society of Iowa within the Iowa Department of Cultural Affairs maintains a number of historic properties open to the public including Clermont Museum, Montauk Historic Governor's House and Union Sunday School at Clermont; the Matthew Edel Blacksmith Shop and Historic Site at Haverhill; Abbie Gardner Cabin in Arnolds Park; Toolesboro Indian Mounds National Historic Landmark near Toolsboro; and Plum Grove in Iowa City. For more information on these and other historic sites managed by the State Historical Society, call 515-281-5111.

Montauk

DeSoto National Wildlife Refuge

Walnut Creek

The Herbert Hoover National Historic Site in West Branch encompasses the Presidential Library-Museum, the original cottage in which the President was born and the Presidential gravesite.
319-643-2541

Effigy Mounds National Monument along the Mississippi River, near Harpers Ferry, preserves unique prehistoric Indian burial mounds, some of which are 2,500-years old. The 1,475-acre monument protects 191 known earthen mounds, many in the form of bird or bear effigies.
319-873-3491

Walnut Creek National Wildlife Refuge and Prairie Learning Center, near Prarie City in central Iowa, offers unique opportunities to develop an appreciation for reconstructed tallgrass prairie, savanna, wetlands and woodlands on this 5,000-acre area. Herds of bison and elk will be included on the prairie.
515-994-2415

DeSoto Wildlife Refuge and Visitor Center is near Missiouri Valley, Iowa. In the fall this 7,800-acre area of Missiouri River bottomland is a stop-over for 500,000 migrating ducks and geese. On display in the visitor center are more than 200,000 artifacts from the sunken steamboat, *Bertrand*.
712-642-4121

Upper Mississippi River National Wildlife and Fish Refuge and Visitor Center, near McGregor, consists of 200,000 acres from Wabasha, Minnesota to Rock Island, Illinois preserving wildlife resources and providing wildlife-oriented recreation.
319-873-3423

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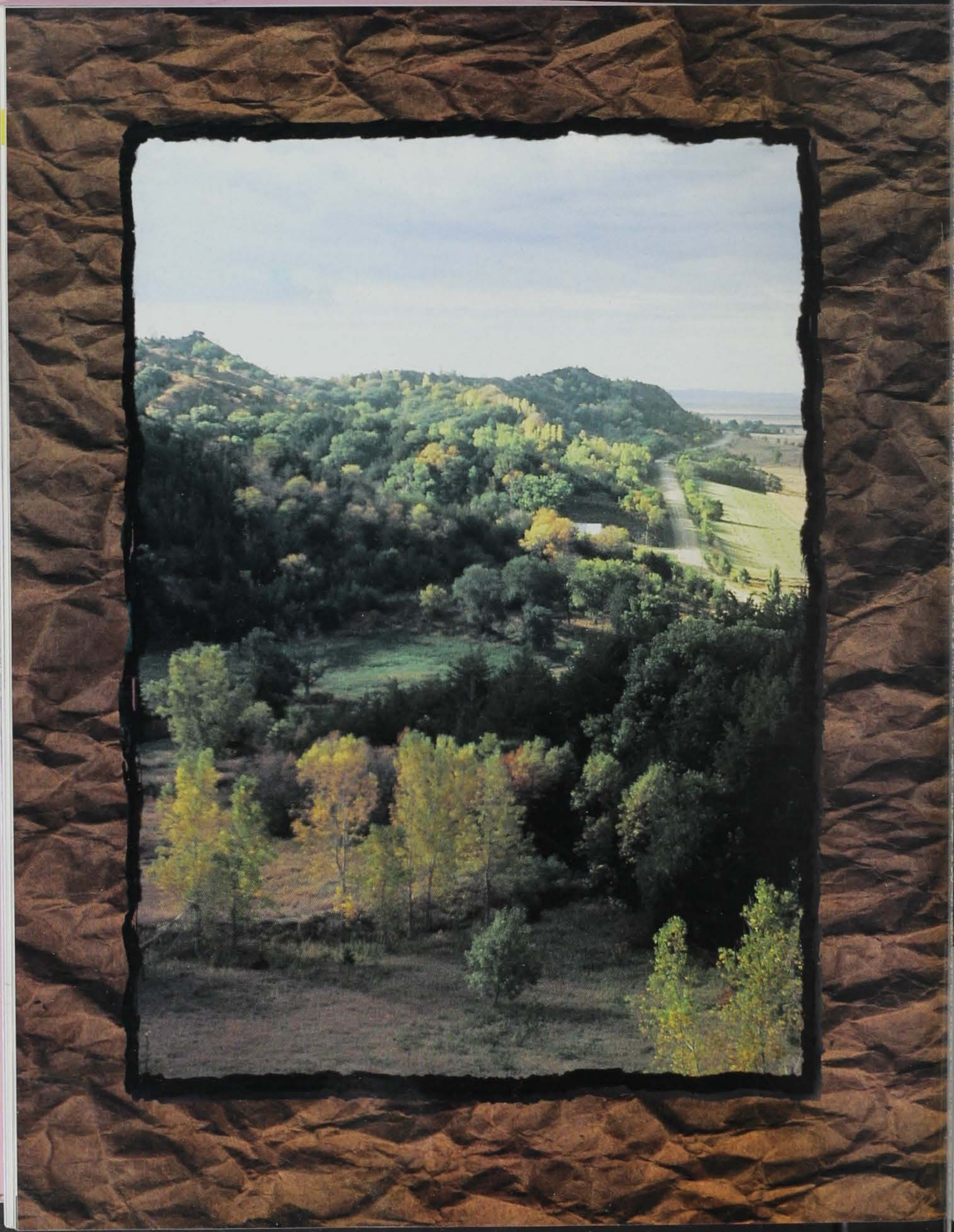
County Conservation Boards

Iowa's 99 county conservation boards offer more than 1,300 park, recreation and wildlife areas for public use and enjoyment. Camping, swimming, fishing, picnicking, boating and hunting are just some of the activities to be enjoyed at county areas in Iowa.

In addition, a number of state parks are managed by county conservation boards including Sharon Bluffs in Appanoose Co.; Heery Woods in Butler Co.; Swan Lake in Carrol Co.; Cold Springs in Cass Co.; Silver Lake in Delaware Co.; Echo Valley in Fayette Co.; Eagle Lake in Hancock Co.; Spring Lake in Greene Co.; Oakland Mills in Henry Co.; Frank A. Gotch in Humboldt Co.; Pammel in Madison Co.; Pioneer Recreation Area in Mitchell Co.; Mill Creek in O'Brien Co.; Lost Island in Palo Alto Co.; Oak Grove in Sioux Co.; and Lake Cornelia in Wright Co. Kearny State Park is owned by the city of Emmetsburg. Regulations and fees may differ from those of the state, in county-managed areas. Information about country conservation board areas and programs is available in the *Outdoor Adventure Guide*.
515-367-4000.

REAP license plates are available from individual county treasurers. A portion of REAP funding goes to park facility restoration and new development.

For more information on state, county and federal areas, the Iowa Division of Tourism offers both the *Iowa Travel Guide*, and a *Camping and Outdoor Guide*.
800-345-IOWA

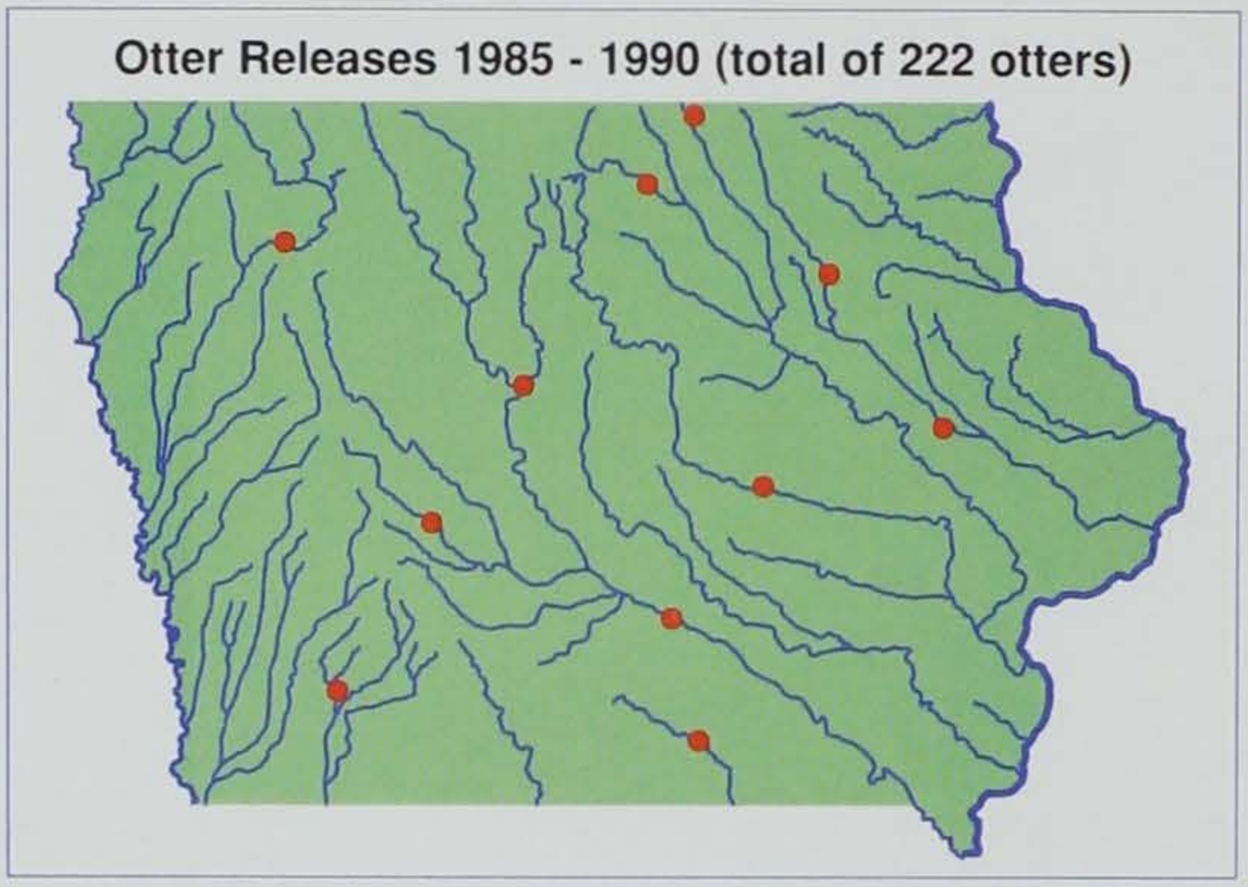


Iowa's River Otter . . .

. . . one critter in all creation that seems to have fun ALL of the time! Otters enjoy everything, and they are once again present for all Iowans to appreciate. From their lope across land, humping along like a fur-covered Slinky, to their movements through water, undulating with sleek, porpoising motions -- otters move through life with amazing grace.

Photo by Ron Johnson

by Pat Schlarbaum



Indeed, the otter's playfulness seems to contradict the thoughts of animal behaviorists who believe animal play exists only for its survival value. Some experts feel young animals, in general, only engage in play to sharpen their hunting skills. So, how does one explain the turtle shell on the ice that otters use as a makeshift hockey puck? The shell's trail through the snow creates a mosaic of unscored activity. Or, why do otters slide down an embankment over and over again? Otters seem to enjoy one another's company -- engaging in many social activities. Otters certainly put a lot of energy into living.

The river otter, *Lutra canadensis*, is a wide-ranging, semi-aquatic carnivore that has historically inhabited much of North America. Otters are almost always found near water, where they feed on fish, crayfish, turtles and other aquatic animals. They have a large yearly home range of up to 50 shoreline miles. However, during any one season, a family may confine its activities to between three and ten river miles.

As members of the Mustelidae family, otters are related to weasels, badgers, minks, skunks, fishers, ferrets and wolverines. Like most Mustelids, otters are, for their size, among the most powerful mammals on Earth. Stories exist of otters moving 70-pound rocks and breaking heavy chains.

Otters are graceful and powerful swimmers. When foraging for fish, otters can cruise with their eyes above water while swimming nearly submerged. When fish are sighted, they arch their backs and dive. Using the sculling and rudder action of their powerful tail, they outmaneuver and capture the slower quarry. Otters are very good food foragers and stories of their predatory prowess describe some of their less-playful-like abilities.

Extirpation

By mid-twentieth century, otters were extirpated from large sections of the central and western United States and became rare where they still existed. In Iowa, otters were abundant during European settlement as indicated by the names Otter Creek in Mitchell, Buchanan, Crawford, Warren and Tama counties, with Otterville, Otter Island, and Otter Creek Marsh distinguished also.

After about 1890 in Iowa, otters only existed along the Mississippi River. Apparently, this residual otter population in northeastern Iowa had difficulty maintaining a threshold population that could pioneer into the tributaries of the upper Mississippi River. Therefore, beginning in 1985, otters were reintroduced to the interior rivers of Iowa in an effort to increase the diversity of Iowa's riparian or river wildlife. Through diversity, the web of life can be strengthened.

Unregulated trapping and hunting, and loss of habitat caused the otters' demise. The incredibly plush otter fur was highly prized, and human greed went unchecked. Wetlands were treated like an enemy, and it seemed, so were creatures connected with it. Consequently, the conflicting agricultural activities and stream pollution eliminated otters from the interior rivers of Iowa.

The loss of otter habitat from many waterways has been a twofold process combining riparian timber removal and stream channelization. The timbered areas provided denning and loafing sites for otters. Stream channelization, widely used in Iowa, has degraded the food resource upon which otters depend -- fish. Consequently, stream quality is deteriorated by increased stream velocity and sediment loads caused by soil erosion. Otters hunt by sight, thus, they prefer clear water.

Like bald eagles and peregrine falcons, river otters sit at the top of their food chain and experience a drop in reproduction rates when pollutants collect in their tissues. Thanks to provisions of the Clean Water Act, Iowans are now providing a better environment for both humans and wildlife living along watersheds, and otters can once again thrive in Iowa waters. Many wildlife professionals believe otters would not have flourished in Iowa without the standards set for clean water in the Clean Water Act of 1972. The presence of otters is an excellent indicator of the improvement in Iowa's water quality. Further improvements will enhance the quality of humans as well.

Reintroduction

By the mid-1980s, otter reintroductions around the nation were becoming

successful. The majority of otters were supplied from the brackish water areas along the Gulf of Mexico, primarily from one family -- Diana and Lee Roy Sevin from Theriot, Louisiana. Alligators, a main predator of young otters in the freshwater regions are not as prevalent in the brackish water estuaries of the Gulf. The Sevins coordinated otter trapping with local trappers in the otter-rich, southern bayou region. Fur harvesters in the area primarily trap nutria, an aquatic rodent larger than a muskrat but smaller than a beaver. On occasion, an otter would be trapped, generally by the front toes. The animals were netted, released from the trap and delivered to the Sevins. With much practical experience in otter husbandry, the Sevins have been able to provide 12 states and some Canadian provinces with otters during the past 39 years.

Through a three-way wildlife trade, Louisiana otters were acquired for Iowa by Kentucky. Kentucky, in return, received Iowa turkeys. DNR turkey trappers, whose salaries and expenses were derived from hunting and fishing license fees, invested thousands of hours getting the birds to Kentucky. The ratio between wildlife management funds and Chickadee Checkoff donations used in the otter trade was approximately 90:10. To supplement the DNR's otter reintroduction efforts, the Iowa Trappers Association and the Iowa Furtakers, in cooperation with the Fisheries and Wildlife Biology Club at Iowa State University, raised funds to purchase 40 otters. Also, the Mitchell County Conservation Board assisted fund-raising in their area to bring otters to the Otranto community in northern Iowa.

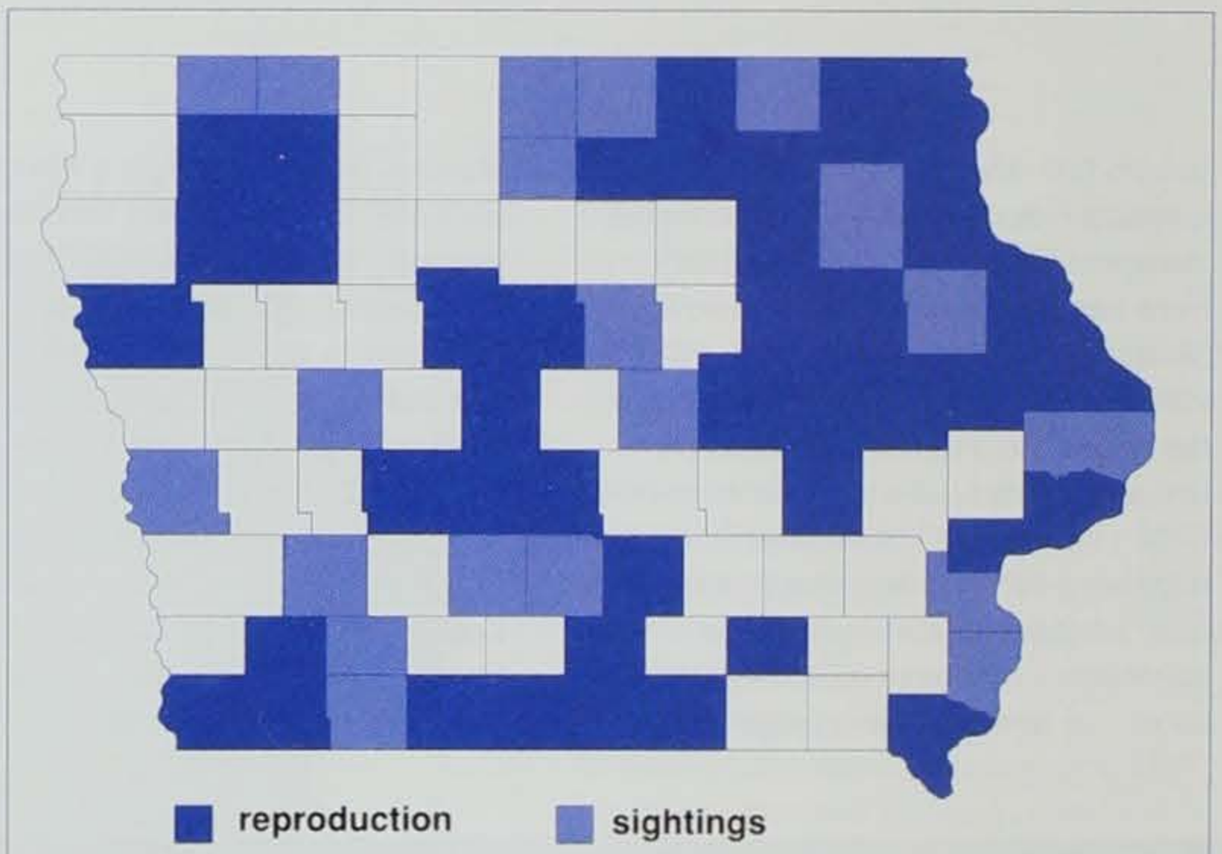
Since it was unknown how southern otters would adapt to Iowa, particularly the cold winters, the first release of eight male and eight female otters at Red Rock Reservoir in 1985 was considered experimental. All otters along the Mississippi watershed are believed to be genetically similar. The same thick fur that provides warmth during Iowa winters, provides cooling insulation during Louisiana summers. Everything from the release to

DNR

■ Thousands of individuals witnessed otter releases around the state in the mid-1980s. All reintroduced otters were tagged in both ears and on their hind feet. Consequently, any untagged animals have provided some of the best documentation of otter reproduction in Iowa.

DNR

Kip Ladage



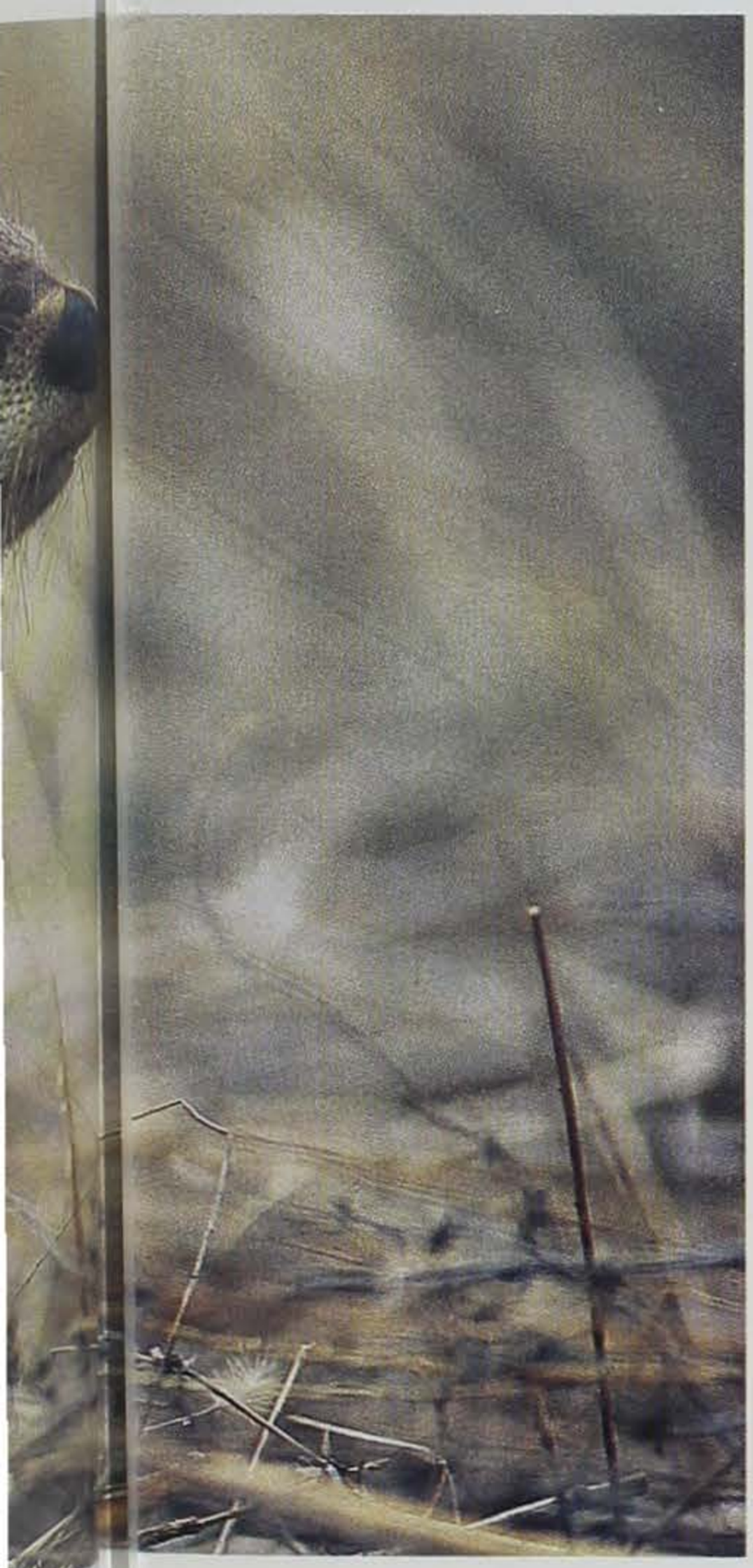
■ Currently, 61 counties have had positive sightings and/or confirmed reproduction of otters.

the monitoring of the animals went very well. The 16 otters were equipped with radio-transmitters to document survival and results indicated the otters could live in Iowa once again. Subsequently, this research found the relocated otters spent the majority of their time near active or abandoned beaver lodges and subsisted on a diet of rough fish. Fortunately, both beavers and fish are abundant Iowa resources.

After determining otters could survive in Iowa, additional release sites were selected along major watersheds around the state. Biologists believe a founder population of otters could reproduce and repopulate the state's interior rivers, through careful management practices. Sites were chosen that would provide a good food source, contain some beaver activity for potential den sites and offer a good distribution of otters throughout Iowa.

By 1990, 11 areas had become the home to 222 Louisiana River Otters. Thousands of school children and conservationists have appreciated the antics of the otters at each release. The sites included the previously discussed Red Rock Reservoir in 1985, Otter Creek, Boone Forks, and Springbrook in 1986, Peterson and Lake Rathbun in 1987, Sweet Marsh, Waubeek and Morton Mills in 1988, Otranto in 1989 and 1990, and Mason City in 1990 (*see map on page 34*). More than 2,200 people enjoyed the furry animals rolling and cavorting along the shoreline of Sweet Marsh near Tripoli, and 2,500 people witnessed the historic return of 20 otters along the Winnebago River at Mason City.

Once the otters acclimated to their new surroundings, their shy and elusive nature became apparent and sightings became less frequent. Otters are mostly nocturnal but come out during the day on occasion.



Ron Johnson

Reproduction

Otters generally mate in winter or early spring. The length of pregnancy is uncertain, but it probably requires between nine and twelve months. Like other mustelids, otter embryos remain dormant for a time. This delayed implantation of the embryos can keep otters from reproducing if environmental stresses are prevalent.

Typically, a single litter is born in the spring and contains from two to four young. Adults re-mate immediately following the birth of their young, providing much joyous and noisy springtime bliss along the watershed.

Young otters or kits do not swim until they are about 14 weeks old, and then they have to be coaxed into the water by their parents. The adults often carry the young on their backs during this phase. If floods occurs before the young can swim, the mother will relocate her litter by carrying the group, one in her mouth and the others, hanging onto her ears or back, to a more suitable den site. Kits stay with their parents during their first winter but leave in the spring.

Sightings

Since those early days of the reintroduction, otter sightings have been reported by numerous outdoorspeople. Otters have been confirmed in at least 61 Iowa counties and along 17 separate watersheds. Reproduction, the key to any successful reintroduction, has been documented at all release sites and at other locations as well. Areas in southern Iowa have apparently benefited from otter releases in northern Missouri. Otter sightings attributed to Missouri otter reintroductions have been noted along the Grand and Nishnabotna rivers. Conversely, otter sightings reported in southern Minnesota, north of Otranto on the Cedar River, have included some Iowa-released otters. Also, the Wapsipinicon watershed releases at Sweet Marsh and Waubeek have produced a separate reproduction site at Independence -- 25 river miles between each release site.

Many road-killed otters have been reported to conservation officers. All reintroduced otters were tagged in both ears and on their hind feet. Consequently, any untagged animals have provided some of the best documentation of otter reproduction in Iowa. But the brunt of otter sightings are provided by beaver and raccoon trappers who observe otter sign or animals, or who have trapped an otter inadvertently. When possible, trapped otters have been released by using a 4-by-4-foot piece of plywood placed horizontally over the animal to restrain it. A 6-by-6-inch notched area at the center of one side provides the space necessary to release the otter from the trap.

Kip Ladage

Kip Ladage

Tom Wahl

Kip Ladage

■ Top left, clockwise: Otter sign, such as scat, prey remains and the distinctive dot-dash-dot track pattern in the snow indicate otters seem to be here to stay.

To minimize trap deaths, trapping is restricted within 10 yards of any active or inactive beaver lodge near the otter release areas. Most trappers indicate a reluctance to trap in areas of known otter activity away from the reintroduction areas.

Sightings of adults otters with young have been noted each autumn, usually from bow hunters with tree stands next to rivers. During this time of year at dusk or dawn, calls of the otter group can be heard. Otters chirp, chuckle, grunt, growl, snarl, whistle and scream. Their distinctive chirping sound is similar to a woodpecker's sharp, barking call and is unlike any sound one would expect from a mammal.

Ron Johnson

Along the shore, otters have regular "pullout" places where they dry and dress their coats by shaking briskly and rolling in sand, grass or leaves. In addition to the scent posts where they leave their droppings, latrines are made about one yard from den entrances.

Otter droppings or scat are greenish and consist of aquatic animal parts, generally fish scales, but scavenged waterfowl feathers and crayfish have also been noted. Frequently, otter scat will be consolidated at a site other otters use. Twisted pieces of grass and heaps of grass pillowed about can also be noted among the scat at these latrine and scent posts. These communal stooling sites are generally located on prominent land-forms associated with water. Triangular land forms created where a tributary stream enters a larger river have become favorite stooling sites for local otters. Also, dikes that impound a backwater or oxbow next to a river inhabited by otters are good places to find otter sign. Stooling sites are known to be used year after year.

When there is snow cover, otter sign is most apparent. Because they are not inhibited by changes in temperature or weather, otters continue to be active all winter. They burrow through the snow with insatiable curiosity and get back under the ice through holes they keep open. Prey remains are often noted near their access points.

Given the opportunity, otters will transform simple walking into an exciting experience. On ice or snow,

Ron Johnson

they alternate loping steps with belly slides, carrying them 4 to 15 feet at nearly 15 miles per hour. By making a couple of loping jump-slide movements, they leave distinctive dot-dash-dot patterns as they streak along.

Future

Future plans for otters in Iowa involve monitoring the animals to document movement into new areas. A computer program has been used to record otter dispersal, reproduction and mortality. Due to their reproductive success, otters have been considered "established" at the 11 release sites. Each year, local otter populations sustain limited mortality due to roadkills and accidental trappings, but the population continues to thrive. Recent discussions have centered on the need to distribute the founder otter population into new watersheds. Methods would include live-trapping animals from otter-rich areas and relocating them to new release sites. This translocation plan is believed to be the most efficient means of bolstering the otter population into major watersheds across Iowa. Trappers once again will rise to assist in the translocation effort. Their expertise and energy will be essential to the capture, relocation and filling of otter voids in Iowa watersheds.

Once a highly prized furbearing species all but eliminated from Iowa, the River Otter is back. This wonderful animal is deserving of the time, expense and effort required for its return. The clean water this species needs is benefiting more than just otters, and Iowans must realize the importance of having quality water into the next century. Clean water doesn't just happen. It requires standards of decency that benefit everyone. What better way to appreciate the joys of clean water than to be fortunate enough to see otters, full of life, doing what otters do best -- spreading their playful antics throughout Iowa's rivers and lakes?

Pat Schlarbaum is a wildlife technician with the wildlife diversity program and is located at Boone.

Kevin Pape

Learning about the loess hills at

Stone State Park

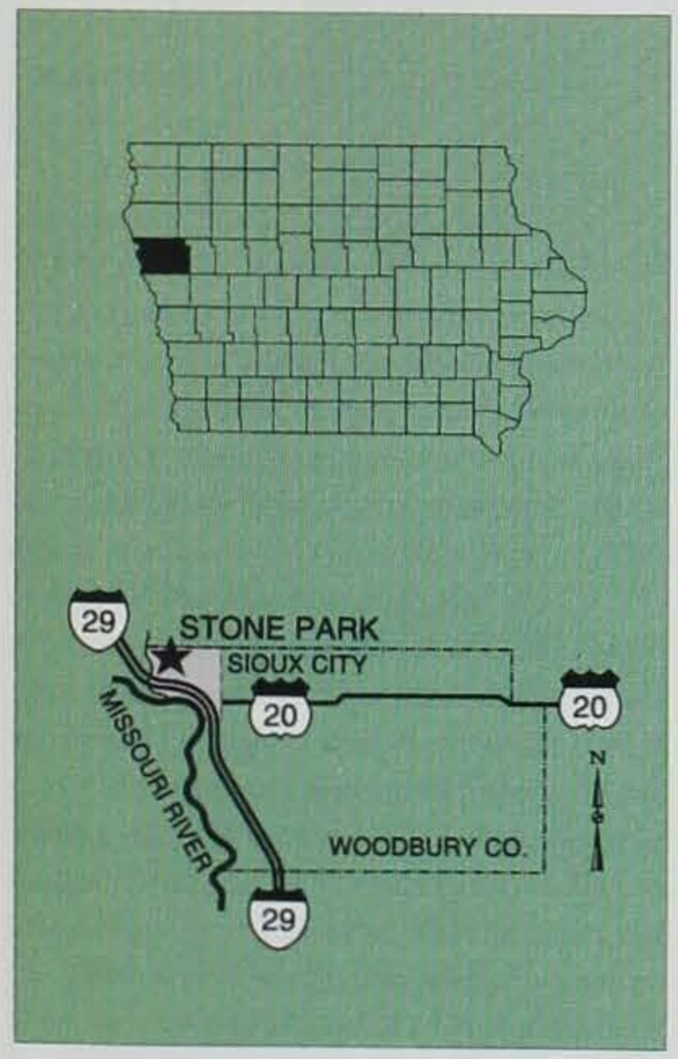
by Kevin Pape

People from around the state of Iowa are beginning to learn more about the loess hills of western Iowa. The area has been the focus of television documentaries, books, tours and magazine articles. Of course, all of this attention is welcomed, especially if it fosters a better appreciation for our state's natural history. If you are interested in learning more about the loess hills, start by planning a trip to Stone State Park.

Stone State Park is located in the northern portion of the hills, four miles from downtown Sioux City. Very few of the park's 1,069 acres are even close to being flat. The combination of steep, dry slopes and wooded valleys allow for exceptional views as well as a diversity of plant and animal life. The area was originally spared from intensive land use because of the rugged topography. The same can be said about the remainder of the loess hills that stretch for hundreds of miles south.

Most people get their introduction to the hills from the seat of a car. The Loess Hills Scenic Byway is a 220-mile-long auto tour which passes through Stone Park. The park road winds through the timber and up steep hills to Dakota and Elk points. From these vantages one can see the Big Sioux River valley and the states of South Dakota and Nebraska. On summer nights, the overlooks are popular with visitors taking in the dramatic view of lights shining from the neighboring communities.

An outstanding introduction to the loess hills can be found at the Loess Ridge Nature Center. The new, $1.4 million facility is in Stone Park, and is



Ken Formanek

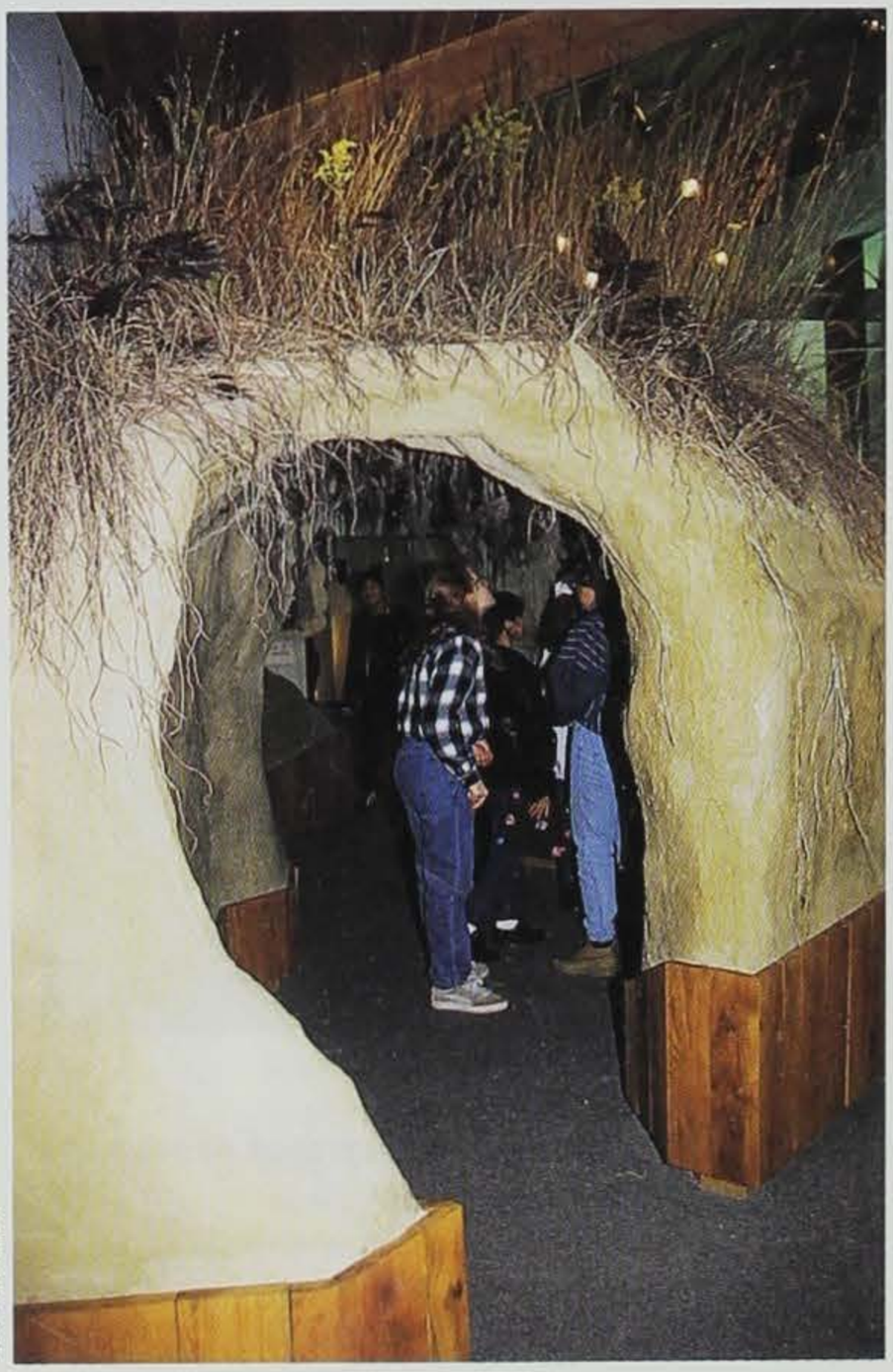
From top:

- **Stone State Park lodge and entrance portal.**

Kevin Pape

Kevin Pape

From top:
- **Children participating in a hands-on nature art exercise at the grand opening of the nature center.**
- **A crowd gathers at the Loess Ridge Nature Center grand opening last October.**
- **Visitors to Loess Ridge Nature Center exploring the "walk under" prairie display.**
- **Far right: For thousands of years, windblown soil drifted along the Missouri River valley, shaping what we now know as the loess hills.**



Ken Formanek

managed by the Woodbury County Conservation Board. Planning for the nature center began in 1990. The nature center is located in the southwest corner of the park along Iowa Highway 12 -- an area rich in natural features.

The center opened in October 1995, after a cooperative fund-raising effort between the Woodbury County Conservation Foundation and the county conservation board. Initial funding for the nature center was through a $400,000 REAP (Resource Enhancement and Protection) grant and $200,000 approved by the Woodbury County Board of Supervisors. Private organizations, individuals, businesses and foundations paid for the remainder.

The nature center has a variety of exhibits for persons interested in learning more about the loess hills. Children love the hands-on exhibits in the Junior League legacy gallery. Native plants and wildlife are depicted in lifelike dioramas. A 400-gallon fish aquarium showcases Iowa's native fish. An active beehive can be viewed from inside the center.

An entirely different world exists underneath the loess hills prairie. Visitors to the nature center can experience the subterranean world of a prairie, complete with dangling roots and a badger den.

The building serves the local community with meeting rooms, kitchen facilities, classrooms and a library. Public programs and nature hikes are held regularly at the center by county naturalists. Two miles of trails around the center will be enhanced this summer through a $50,000 grant. One trail takes visitors to the remnants of an old toboggan run.

The toboggan run is a part of Stone Park's rich history. Concrete footings from the run can be seen from a trail near the nature center. The footings supported a long wooden chute that provided winter fun for two seasons in the early 1940s. However, the run had difficulty holding snow, since it faced west. Plans were also made for a ski area and skating rink,

but they never materialized.

The majority of Stone's facilities were constructed by the Civilian Conservation Corps (CCC) from 1935 to 1939. The CCC used rose-colored quartzite as a building material. Workers built two park residences, trails, roads, rest rooms and picnic shelters. The rustic Stone lodge continues to be popular for family gatherings, 60 years after it was constructed.

Stone Park was a popular destination long before becoming a state park. Thomas Jefferson Stone owned the land from 1895 until his death in 1904. In 1905, Edgar Stone began an effort to make a park to honor his father. Until the start of World War II, the park had a zoo with elk, bear and chimpanzees. Ownership of the park passed from the Stone family to Sioux City in 1912, and eventually became Stone State Park in 1935.

Jerry Leonard

Present-day park visitors can reserve one of four picnic shelters. A small pond can be fished for bluegill or bass. The Big Sioux River provides some excellent catfishing. The campground offers 32 sites in an attractive setting. And, a new playground is being built this year, thanks to the generosity of local businesses and the Missouri River Historical Development group.

Perhaps the best part of Stone Park is viewed from the 14 miles of trails. Six miles of trails are open for horseback riding, mountain biking and snowmobiling. The trails allow visitors an opportunity to escape from the pressures of everyday living. The eight miles of hiking trails include the Carolyn Benne self-guided trail where visitors can study the park's natural history at their own pace.

A $100,000 trail renovation project is planned for this year. Worn trails will be reshaped to improve accessibility for all trail users. Maintaining trails in the loess hills is a challenge. The fine loess soil dries quickly, leaving a trail surface similar to whole wheat flour. Subsequent rains easily wash this loose soil away.

Loess (pronounced "luss") is a German word which means loose. Loess is wind blown soil and, as such, can be found throughout the world. Major loess deposits are found along the Rhine River in Germany, along the Yellow River in China and along the Missouri River in Iowa.

Iowa's loess hills were created between 18,000 and 150,000 years ago. During this period, glaciers ground up rock into a fine powder. The powder was washed downstream as the glaciers melted. In cold periods, the water stopped flowing and the silt was exposed to strong winds. The winds were predominantly out of the north and west, therefore the silt was blown south and east of the river valley. The majority of the deposits were made close to the river valley, in drifts of up to 200 feet.

Thousands of years of wind and rain have continued to shape the hills. The hot, dry, southwest-facing slopes provided good habitat for prairie plants. Stone Park has more prairie intact than any other of Iowa's state parks and recreation areas. The 90-acre Mt. Talbot State Preserve in the northern portion of the park harbors more than 75 species of native plants.

Plants that are normally found farther west can be seen at Stone. The pointed leaves of the yucca stand out

Kevin Pape

Kevin Pape

■ **The 1,000-plus-acre Stone State Park offers exceptional views of the loess hills. This unique landform has plant life often found further west, such as the yucca plant.**

among the other prairie plants. The yucca produces a three-foot-tall stem with creamy white flowers in June. The plant depends on the pronuba moth for pollination. The moth lays its eggs in the developing seed capsules, and the larvae feed on the yucca seeds. The moth and the plant have a symbiotic relationship -- depending on one another for survival.

Department of Natural Resources staff, in cooperation with the county conservation board, private environmental groups and volunteers, have been learning to actively manage the park's prairie remnants. In the absence of fire, small trees and shrubs have invaded the prairie ridges. A concentrated effort is being made to curb expanding woody growth with controlled fires and brush-cutting. Controlling brush is a challenge throughout the loess hills.

The park's woodlands are dominated by bur oak. Small tracts of oak savanna exist in the park. Savanna, a mix of widely spaced oaks and prairie, was once a common component of Iowa's pre-settlement vegetation. Controlled burning is expected to enhance the savanna. Bur oaks have thick fire resistant bark which allows it to survive where other trees cannot.

Although the park is close to Sioux City, visitors can expect to see a diversity of wildlife. In fact, the park is recognized by The National Institute For Urban Wildlife as an Urban Wildlife Sanctuary. Early-morning visitors are often treated to close-up views of wildlife. Wild turkeys are a common site along the roads and trails. Bird-watchers can expect to see indigo buntings, ovenbirds, and rufous-sided towhees. A flock of about 30 turkey vultures roost along a trail in the park and spend the days riding the thermals over the hills. Butterfly enthusiasts might glimpse an Olympia white or an Ottoe skipper.

The dramatic landscape of the loess hills repeatedly attracts visitors from Iowa and points around the Midwest. Quite often these visits are an inspiration to learn more about how these hills were formed, what plants and animals live here, and what remains to be discovered in this unique landform. Stone Park is an excellent place to do just that.

Kevin Pape is the park ranger at Stone State Park.

Kevin Pape

■ **Pointed crystals of white *calcite* and translucent yellow cubes of *fluorite* line the edges of this gray limestone collected near Postville in Allamakee County. Calcite (calcium carbonate, or lime) is the primary mineral in limestone, while fluorite is rare. Such crystal growths are found along open spaces (vugs or fracture traces) within the rock.**

Tim Kemmis

■ **"Dog-tooth spar" is the name given to sharply pointed crystals of white *calcite* as seen on this massive piece of gray limestone from Mahaska County. Also prominent are brass-colored masses of *pyrite* crystals, known as "fools gold."**

Pat McAdams

■ **This wind-polished and lichen-covered rock of Sioux *Quartzite* is from Lyon County in the northwest corner of Iowa. Quartzite is composed of compacted *quartz* grains solidly cemented together with *silica*, giving the rock a glassy appearance and a very hard surface. Its resistance to weathering makes it useful as highway and railroad aggregate.**

MINERALS

by Jean Cutler Prior

Minerals are the building blocks of the Earth's rocks. They have a specific chemical composition and a characteristic crystal form. The Iowa minerals shown here display an appealing range of color and shape.

Many people are introduced to the field of geology through the fun of searching for and collecting minerals. Beautiful varieties can be found in Iowa's sedimentary rock strata, outcropping in road cuts, quarries, strip mines, and along stream banks or valley sides. Striking crystals make up many of the coarse-grained igneous and metamorphic cobbles and boulders that lie in pastures and farm fields where they were left by melting glaciers. Gravel pits along Iowa's valleys and the gravel bars within river channels are also good places to find a wide assortment of mineral specimens.

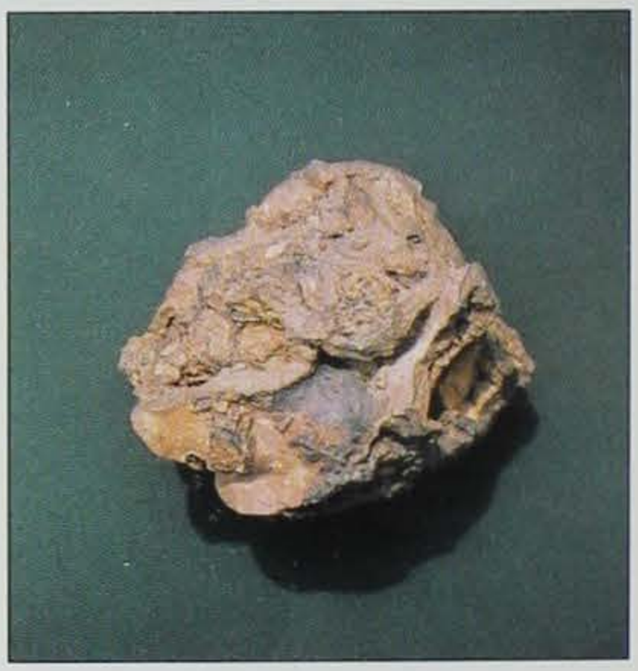
In addition to their crystalline beauty, information about a mineral's geologic age and origins can be obtained from its chemical isotopes and from its association with other minerals. Mineral resources play a significant role in our daily lives, and Iowa's mineral industries are valuable to the state's economy.

❖ ❖ ❖

Tim Kemmis

■ *Coal* **is a combustible rock, rich in** *carbon* **and formed by compaction of fossil plant remains similar to peat. Thin veins in this piece are filled with** *pyrite*, **an abundant ore of** *sulfur*. **Coal was mined from seams in the Pennsylvanian-age rocks of south-central Iowa, with peak production during the early 1900s.**

■ **The tall, slender crystal of** *gypsum*, **a variety known as** *selenite*, **is from Appanoose County. It has a soft, easily scratched surface. A related sulfate mineral, also formed by evaporation from seawater, is called** *anhydrite* **(lower, banded rock). Gypsum is mined in Webster and Des Moines counties for wallboard production.**



■ *Limonite* **is a distinctively yellowish brown ore of** *iron*. **It takes many forms, including the cellular structure seen in this sample from the historic Iron Hill area near Waukon in Allamakee County.**

■ *Galena* **has a distinct metallic-gray luster and a cube-shaped crystal form. It is very heavy and is the principal ore of** *lead*. **This mass of crystals is from Dubuque County, where lead ores were mined for over 300 years from veins in the dolomite bedrock.**

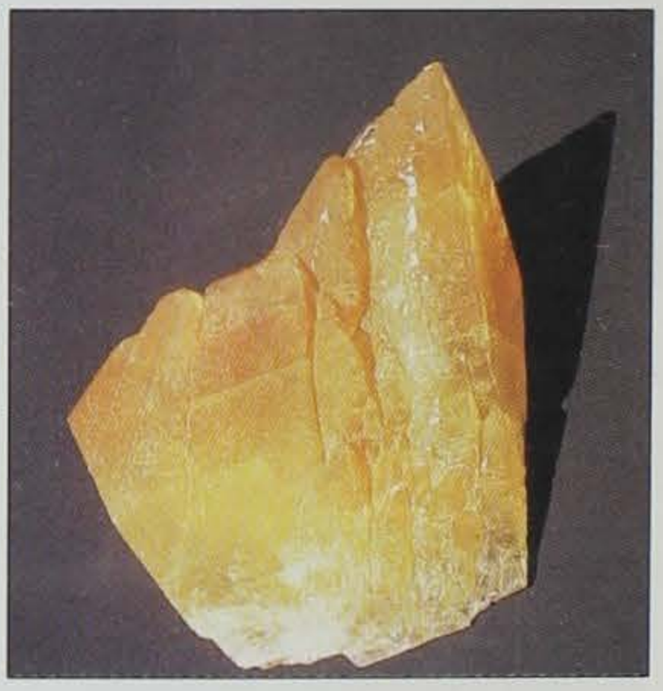
■ This impressive *stalactite* is from a cave in Winneshiek County. Such cave decorations are composed of the mineral *calcite*, and are deposited in distinctive shapes by the slow dripping of lime-rich groundwater.

■ Grains of the mineral *glauconite* can give sandstone a distinctive greenish color. Glauconite is found in marine sedimentary rocks, and it indicates a slow rate of sediment accumulation. This glauconitic sandstone outcrops in Allamakee County, along the Upper Iowa River and at Lansing.

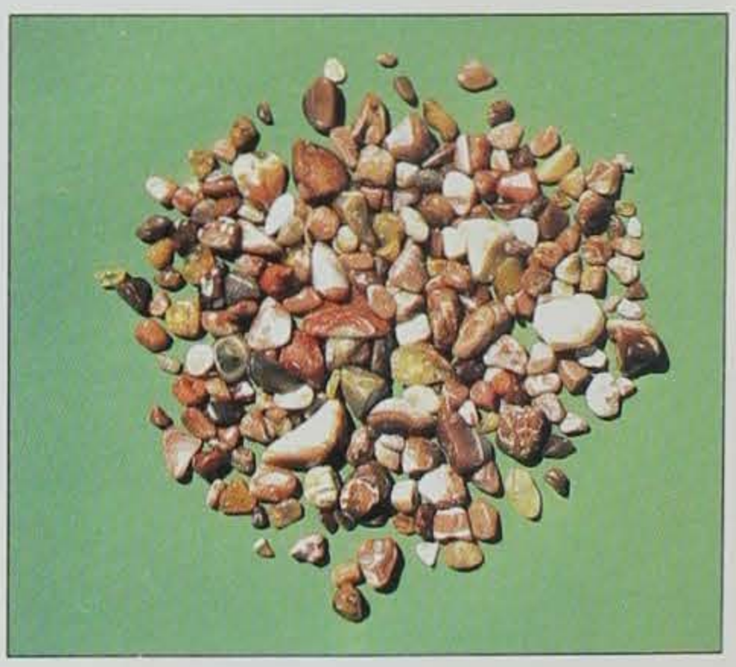
■ Metallic clusters of *pyrite* crystals ("fool's gold") form bumps on a piece of limestone collected in Black Hawk County. The pattern of mineral clusters is a result of mineral growth in the honeycombed openings of a fossil colonial coral in the limestone.

■ Heavy nuggets of the mineral *copper*, a good conductor of heat and electricity, are found on rare occasions in Iowa's glacial deposits. This 67-pounder, tarnished with greenish oxides, probably originated in the Lake Superior area of Michigan's Upper Peninsula.

■ This pyramid crystal of translucent *calcite* is from Mahaska County. Calcite is the principal mineral in limestone, chalk, and marble. It occurs in a variety of colors and bubbles vigorously when a drop of dilute hydrochloric acid is applied.



■ Known to mineral collectors as *"rice agate,"* these polished stones of black *chert (flint)* consist of a dense variety of *silica* found in the sedimentary rocks of Montgomery County. The "rice" pattern comes from numerous white shells of fossil fusulinids, a tiny marine protozoan.



■ These *agates* (varieties of dense but translucent *quartz*, *chalcedony*, and *opal*) are from Mississippi River gravel deposits in Clayton County and have been tumbled to a high polish. They include the prized Lake Superior agates, known for their fine, alternating bands of rich colors.

■ *Feldspar* is a widespread mineral especially common in igneous rocks such as granite. This blocky fragment of crystalline feldspar was found in gravel deposits along the Cedar River in southeastern Linn County. It probably weathered out of a granite boulder carried into Iowa by a glacier.

■ *Barite* is an unusually heavy mineral. This sample from Fayette County is composed of rounded masses of radiating crystals. Barite is used primarily as an additive in drilling muds and paints.

Tim Kemmis

■ Fragments of *petrified wood* can be picked up from glacial-age gravels along Iowa's rivers. This water-worn piece from the Cedar River in Linn County shows that *silica*, in the form of *chalcedony* or *opal*, completely replaced the original tissue, with tan and dark-brown bands revealing the original wood grain.

■ Iowa's State Rock is the *geode*. Those having hollow, crystal-lined interiors are prized by mineral collectors. The well-known "Keokuk geodes" (this opened one showing clusters of sparkling quartz crystals) can be found in stream beds and dug from shale outcrops along the Des Moines and Skunk rivers and their tributaries in southeast Iowa.

Reprinted from the 1994 issue of *Iowa Geology*. Photos by Paul VanDorpe. Photo setups by Patricia Lohmann.

THE PRACTICAL CONSERVATIONIST

Fresh Outdoor Fare

While the outdoors can provide a selection of delicious edibles year round, spring and summer make the abundance of nature's bounty very obvious. The following recipes from the *Wardens' Cookbook 1990 Supplement*, by the Iowa Fish and Game Officers Association, tell how to prepare turkey, jam and fish -- in a variety of ways. Included are a tempting rice pilaf, a nearly all-purpose batter, mushroom recipes and several scrumptious desserts. Gather in the goodness of the "wild outdoors" and enjoy.

The *Wardens' Cookbook* and *1990 Supplement* are available for $14 and $5 respectively, including shipping, or $6.50 for the supplement alone. Write George Hemmen, 2277 250th St., Guthrie Center, IA 50115.

Marinated Turkey Breasts

1/2 tsp. ginger
1 cup each of soy sauce, peanut oil and white wine
1/2 cup lemon juice
1/4 tsp. pepper
1/2 clove garlic, crushed
1/4 cup crushed onion

Soak meat eight to 24 hours. (The meat should be approximately one-inch thick.) Do not put the meat into the solution until the meat is completely thawed. A plastic bag works well for marinating the meat. It keeps the solution covering the meat and is easily turned over. Cook on the grill over medium heat. Do not overcook.

Violet Jam

Place in your blender one cup of violet blossoms (packed tightly), 3/4 cup water and two tablespoons lemon juice. Blend to a paste. Then add two cups of sugar to the paste in the blender. Blend slowly until combined. Stir one package Sure-Jell into 3/4 cup water and bring to a boil. Boil one minute. Pour into the blender and blend with the violet mixture for one minute. Pour into clean jelly glasses and freeze when cooled. This jam also keeps for three weeks in the refrigerator without freezing.

Oven Fried Fish

This can be used with all kinds of game fish fillets. Season the fillets with salt, lemon and pepper. Prepare a batter using one egg and one cup water for each pound of fish. Dip the fillets in the egg-water mixture and roll in cracker or bread crumbs, crushed cornflakes or corn meal. Bake in a 500 degree oven on a greased cookie sheet for 15 minutes.

Catfish Chili

2 lb. catfish fillets cut into chunks
1 cup chopped green pepper
2 T butter
2 cloves garlic, minced
1-1/2 tsp. chili powder
2 tsp. salt
pepper to taste
1 lb. can red kidney beans
1 lb. can tomatoes
1 small can tomato paste

In the pot, sauté green pepper and chopped garlic in butter until tender. Add chili powder, salt and pepper and mix well. Add canned tomatoes and beans, including juice and simmer. Cover and cook 15 minutes. Add fish; cover and simmer 15 more minutes until fish flakes apart with fork.

Stuffed Trout

2 (12-inch) trout
4 oz. cooked crab meat
1/2 stalk celery, chopped
1/2 small onion, chopped
4 small mushrooms, sliced
1 T butter
2 slices bread, toasted and cubed
a dash each of pepper, salt, garlic powder and basil
1 egg

Melt butter in a sauce pan. Lightly fry onion, celery and mushrooms. Add bread, crab meat and seasonings. Cool. Add egg and stir mixture well. Stuff trout cavities with mixture. Place trout in greased pan and bake for 20 minutes at 350 degrees.

Barbecued Catfish

12 catfish fillets
melted butter
1/8 tsp. paprika
1/2 cup salad oil
1/4 cup white vinegar
1/4 cup catsup
2 T sugar
1/4 tsp. salt
1/4 tsp. pepper

Brush fillets with butter and place on grill three to four inches from hot coals. Combine the rest of the ingredients and mix well. Coat fillets with liberal amounts of sauce and cook five minutes on each side until done. Brush often with sauce. Serves six.

Cucumber Broiled Panfish

1-1/2 lbs. panfish fillets
1/2 cup unpeeled cucumber, finely chopped
1 cup mayonnaise
1 T fresh (or 1 tsp. dried) dill weed
2 green onions, finely chopped
1/2 tsp. lemon juice
4 drops tabasco sauce

Butter large oven-proof platter. Arrange fillets in single layer on platter. Combine the rest of the ingredients and spread evenly over the fillets. Broil in preheated oven four inches from heat for four to five minutes, until top is brown and fish flakes when probed. Serve with lemon wedges. Serves four.

Boiled Pike

3 lb. pike fillets, cut into bite-sized chunks
1 whole onion
2 T salt
20 pepper corns
2 T vinegar
2 T sugar
2 bay leaves
3 quarts water
melted butter

Put onion, salt, pepper corns, vinegar, sugar and bay leaves into the water and bring to a boil. Simmer for 15 minutes. Add fish and bring to a boil. Cook 10 minutes, simmering. Drain and serve chunks in melted butter. Serves six.

Fish Flavor-Keeping Hint

Want to keep fish frozen longer without loss of flavor and freezer burn? Freeze in plastic bags with enough water to cover them. There is no freezer burn or drying out.

Mushrooms

There are many ways of preparing these spring delicacies but these recipes are two favorites:

First -- Split and wash your mushrooms. Place them in a cooking pan with about two inches of water. Bring to a boil and cook about five minutes. Cool well. Put them into containers, dividing the liquid among the containers. Freeze, then the next time you have a beef roast, add a container of mushrooms. What good eating!

Second -- Split and wash your mushrooms. Drain well. Beat four eggs. Dip mushrooms into egg mixture, roll in one pound finely ground cracker crumbs and fry until light brown in butter or margarine. Place on cookie sheets. Freeze on cookie sheets, then package them into resealable freezer bags. When you want to serve them, place them, still frozen, on cookie sheets in a 400-degree oven until you see they are getting hot and crispy. They taste like fresh ones!

Crawdad Pilaf

2 cups cooked rice
1/2 cup stuffed olives, sliced
1 small onion, sliced
1 medium green pepper, chopped
1/2 cup grated cheddar cheese
3 cups cooked crawdad meat
4 T flour
2 cups milk
3 T butter

Combine rice, olives, green pepper, crawdad meat and most of the grated cheese together in a well greased casserole dish. Make a medium white sauce of flour, butter and milk and season to taste. Pour over the casserole and sprinkle with the remaining cheese. Bake at 350 degrees for 30 minutes or until the top is brown. Serves six.

Beer Batter for Fish, Chicken or Onion Rings

2 cups flour
2 tsp. baking powder
1 tsp. salt
2 eggs, slightly beaten
2 cups beer
1/2 cup salad oil

Beat this mixture in a large bowl until smooth. Dip fish, chicken or onion rings into batter, allowing excess to drip. Fry in deep fryer or deep pan in hot oil until golden brown.

Quick Rhubarb Cake for Two

2 cups finely chopped rhubarb
1/2 cup sugar
1 small yellow cake mix (Jiffy or similar brand)
1/2 cup real whipping cream (or 1/4 cup melted butter or margarine and 1/4 cup canned skim evaporated milk)

Put raw rhubarb in the bottom of a 6 x 9-inch cake pan. Shake dry cake mix evenly over rhubarb. Pour the cream over this and bake at 350 degrees for 45 minutes. Serve hot or cold.

Black Cap Pie

Crust: To four cups flour, add a dash of salt, then 1-1/3 cups shortening. To a slightly beaten egg, add 10 tablespoons water and two teaspoons vinegar. Mix flour, salt and shortening with a fork to crumble stage. Add egg, water and vinegar, mixing them all together. Roll on a lightly floured surface to desired thickness. Makes four large pie crusts (two pies).

The crust is easy to roll and can be stored in the refrigerator for several days (while you pick berries).

Filling: Add two cups sugar plus 1/2 cup flour mixed with 2 cups cream to 6 cups wild raspberries (black caps). Bake at 450 degrees for 15 minutes. Reduce heat to 375 degrees for approximately 30 minutes.

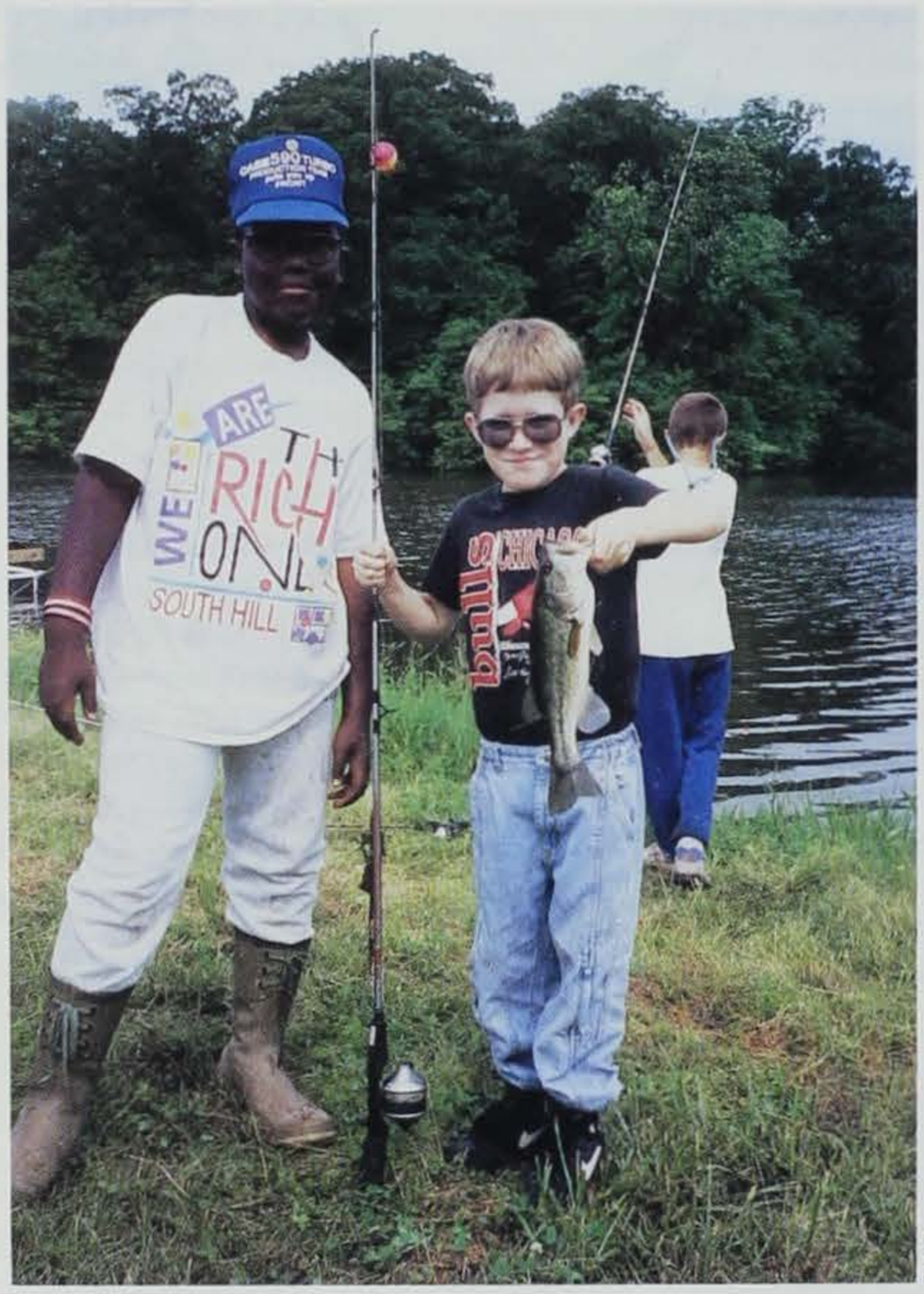
Stand guard until cool, then stay out of the way . . . better go pick more raspberries!

Timber Gooseberry Pie

3 cups gooseberries
1 cup sugar
1/4 cup water
1/2 cup sugar
2 T flour
dash salt
1/2 tsp. each of cinnamon, cloves and nutmeg

Cook the first three ingredients until berries are tender. Combine with remaining ingredients. Pour into a 9-inch pie crust, dot with butter, add top crust and bake at 450 degrees for 10 minutes, reduce heat to 350 degrees and bake for 20 to 25 minutes.

CONSERVATION UPDATE



DNR

FREE FISHING DAYS!

During the week of June 3 , 1996, the DNR will join with other agencies and organizations to celebrate National Fishing Week. The DNR has also set aside June 7, 8 and 9, 1996, as Free Fishing Days and fishing *license* requirements will be waived for Iowa residents during these three days. All other regulations apply.

Updated Trout Guide Available

The ***Iowa Trout Fishing Guide***, a free and complete guide to trout fishing in Iowa, has recently been updated and reprinted. It is available at the three state trout hatcheries and many trout stamp outlets, or by calling 515/281-FISH (3474) or writing the Iowa DNR, Wallace State Office Bldg., Des Moines, IA 50319-0034.

Trout stocking information is available 24 hours a day by calling the DNR's trout hatcheries -- Manchester 319/927-5736; Decorah 319/382-3315; and Big Springs 319/245-1699.

Opinion Affirms Water Enthusiasts Rights

Public recreational rights in Iowa streams were analyzed in a recent opinion of the Iowa Attorney General. The opinion concluded that the public right to float a stream for recreational purposes and engage in related activities depends on whether the stream is "navigable." Rights of public recreational navigation do not depend on whether the stream bed is in public ownership.

Activities related to recreational navigation are swimming, fishing and wading. Some types of waterfowl hunting on navigable streams may be viewed as part of the right of recreational navigation if such waterfowl hunting is customary. Owners of the beds of navigable streams have the right to fence across the streams to confine livestock as long as they do not obstruct passage by boats.

Generally, to be "navigable" a stream must have enough flow, in a wet year, to float a person in a canoe or other small watercraft during most of the boating season.

The opinion responded to a legislator's inquiry concerning rights of the public to wade, fish and hunt in streams that are "navigable" but not "meandered." Meandered streams are those that have been owned by the state since Iowa's admission to the Union. The beds of many of Iowa's popular canoeing and fishing streams are not publicly owned.

Iowa courts have not been presented with any dispute concerning public recreational rights on non-meandered, navigable streams. The opinion interpreted Iowa statutes and reviewed court decisions from other states. An Attorney General's opinion is not binding on Iowa courts but provides guidance to public officials in interpreting laws.

Forest Foray -- A Celebration of the Des Moines River Valley

Become immersed in the beauty of nature at the Iowa 4-H Education and Natural Resources Center near Madrid, while attending a celebration of the Des Moines River valley, June 21 to 23. Sessions will include forest ecology, forestry techniques, bird watching, plant and fungi identification, canoeing, archaeology and history of the Des Moines River Valley. The event is for families and people who want to learn about Iowa's natural and cultural heritage. Teachers can receive college credit and activities are planned for children. Pamphlets and registration forms are available by writing or calling the Iowa 4-H Education and Natural Resources Center, 1991 Peach Ave., Madrid, IA 50156, 515/795-3338.

Lake Rathbun Crappie

"Lake Rathbun's anglers harvest as many as 400,000 crappies each year, making the crappie the most important sport fish species in the lake," according to Larry Mitzner, DNR fisheries biologist. "Some anglers believe regulations designed to decrease angler harvest would increase the crappie population. However, research has shown environmental factors such as temperature, wind and water clarity during spawning are crucial in producing good crappie fishing. The single most important factor is the lake's water level during the April through August time period."

"High water levels result in greater crappie reproduction, thus benefiting crappie fishing two to three years later," Mitzner said. "Likewise, crappie population and angler harvest records maintained since 1972 show regulations to restrict harvest by either size or creel limits are not necessary for Lake Rathbun's crappies. A 10-inch minimum length limit would reduce the crappie harvest by 50 percent, but this would not result in more crappies in the lake because the released fish will die of natural causes."

The bottom line? Lake Rathbun has produced some of the state's best crappie fishing since its construction 20 years ago. The number of crappies available to anglers varies each year, depending how young crappies survived in the previous two or three years. Regulations will not improve Lake Rathbun's crappie fishing and anglers need not worry. They are only removing the harvestable surplus.

Iowa's Youth Deer Season Sets New Record

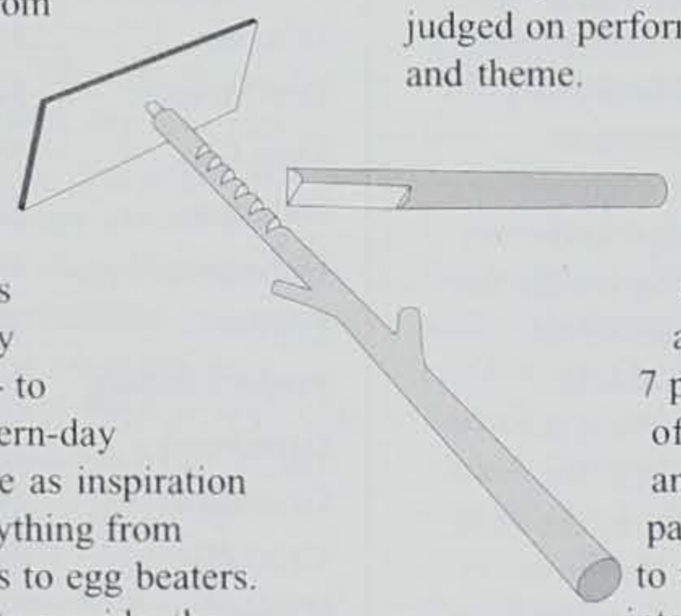
The DNR issued a record 2,507 deer licenses for the 1995 youth season, according to Anjeanette Perkins, DNR wildlife biologist. License numbers were up 25 percent from 1994, and 42 percent from the first youth season in 1992. Increases occured in both paid and free licenses -- 2,241 paid licenses and 266 free licenses were issued.

The DNR has recieved a number of favorable reponses about the youth season since its inception, and Perkins said part of the increase may be because the public is more aware of the season and application deadlines. However, a change in the season structure may have been the major contributing factor for the increase. In the first two years of the hunt, the season consisted of three weekends in September. Starting in 1994, the youth season was expanded to include weekdays, thus making about ten more hunting days available.

Applications for youth deer season will be available in early June at county recorder offices and most DNR offices. The youth deer season application deadline is July 19.

Whammy Diddle Championship Spins

According to some story tellers, the world as we know it can be attributed to a curious device called a whammy diddle. Carvers of this manually manipulated wooden wonder trace the wammy diddles' history from medieval stories such as *The Once and Future King* -- in which young Arthur is said to have pulled the sword from the stone in order to use it to carve his whammy diddle -- to it's modern-day influence as inspiration for everything from airplanes to egg beaters.



History aside, the question must be asked, what exactly is a whammy diddle? This hand-operated oddity consists of three parts: a main stick, a rubbing stick, and a twirly thing. To make the whammy diddle work, the twirly thing is placed on the end of the main stick which is then rubbed with the rubbing stick. As expected, the twirly thing will twirl.

Whammy diddle enthusiasts are invited to share their whammy diddle designs, stories and talents at the whammy diddle championship taking place Saturday, July 6 at 7 p.m. at the Lake Wapello State Park amphitheater. The championship will consist of five categories including the largest whammy diddle, measuring the diameter of each end in addition to the length; spins, which will be determined by the number of full spins per direction in one minute; number of spinning twirly things; best performance of a whammy diddle story, judged on historical accuracy and originality; and best whammy diddle song, judged on performance and theme.

Entrants should be at the amphitheater before 7 p.m. the day of the event and notify the park staff as to their interest in participating. If electricity is required, the park staff should be notified before June 29.

There is no charge for entering the event and the top three winners in each category and an overall champion will be awarded prizes.

In addition to the championship, the park will also display whammy diddle collections and feature demonstrations for improving whammy diddle skills on Friday, July 5.

For more information contact Mike Godby, Lake Wapello State Park Attendant at 515-722-3371.

CONSERVATION UPDATE

Fishing Clinics Are Here! Brush-up On Your Skills

Spring is an excellent opportunity to dust off the tackle and go fishing at one of Iowa's many lakes, streams or rivers.

Spring also brings fishing clinics to help beginning anglers start out or "old pros" brush-up on their angling skills. The DNR, along with county conservation boards, and conservation groups, and many city park and recreation offices offer clinics, derbies, camps and other special fishing events for anglers of almost any age, skill or ability.

Adjacent is a list of the 1996 events the department is aware of at press time. For more information or to find out other events that may be scheduled for your area, contact your county conservation board or local park and recreation office.

Clinics and/or Tourneys for Youth

City	Date	Contact
Algona	June 8	515/295-7275
Ames	May 18	515/232-2516
Bedford	June 9	712/523-2700
Bellevue	June 8	319/652-3783
Bloomfield	June 8	515/664-2138
Blue Grass	June 18	319/323-7709
Burlington	June 8	319/753-5808
Cedar Falls	June 18	319/277-2187
Clear Lake	June 8	515/357-3517
Clear Lake	June 3-6	515/357-7010
Colwell	July 13	515/257-6214
Davenport	June 8	319/391-2041
Denison	July 4	712/263-5901
Des Moines	June 8	515/999-2557
Dow City	May 27	712/263-5901
Dubuque	July 13	319/582-9395
Dubuque	June 9	319/582-9395
Fayette	May 11	319/422-3883
Fredericksburg	June 7	515/394-4714
Grandview	June 8	319/523-8381
Greenfield	June 8	515/743-6665
Grinnell	June 1	515/236-7008
Harlan	June 8	712/773-2701
Iowa Falls	July 4	515/648-9686
Jefferson	June 9	515/386-4629
Ladora	June 8	319/655-8466
Lewis	June 8	712/243-3542
Maquoketa	Aug. 17	319/652-3783
Moravia	July 13	515/647-2406
Muscatine	June 1	319/264-5922
Nashua	June 9	515/394-4714
New Hampton	June 8	515/394-4714
Panora	May 15	515/755-3061
Pleasant Valley	June 22	319/794-4301
Salix	June 2	712/255-8970
Sioux Rapids	June 8	712/749-2563
Spencer	May 24	712/933-5532
Spirit Lake	May 18	712/732-2118
Urbandale	June 1	515/285-2358
Winterset	June 8	515/462-3575

Clinics and/or Tourneys for All Ages

Date	Location	Contact
Anamosa	June 9	319/462-2761
Bennett	Sept. 7	319/886-6930
Black Hawk	Aug. 17	319/277-2187
Cedar Falls	June 8	319/266-6813
Centerville	June 8	515/856-8528
Centerville	Sept. 21	515/856-8528
Clarinda	June 8	712/542-4587
Des Moines	June 8	515/276-7633
Elkader	June 8	319/245-1516
Gilmore City	June 9	712/335-4395s
Hampton	June 8	515/456-4903
Knoxville	June 8	515/627-5935
Newton	June 29	515/792-5135
Ottumwa	June 8	515/682-3091
Rockwell City	June 8	712/297-7131
Sioux City	June 22	712/258-0838
Sioux City	Aug. 24	712/258-0838
Villisca	June 8	712/623-4753
Waterloo	Aug. 10	319/277-2187
Woodbine	June 8	712/647-2785

Special Events

Location	Date	Information
Cedar Rapids	June 30	319/362-5738
Cherokee	June 8	712/225-2715
Des Moines	June 7	515/999-2557
	June 8	515/222-3453
Dubuque	Aug. 10-11	319/556-4219

Fish Iowa! Mentor Sessions

Fish Iowa!, the fishing module designed for middle through high school physical education classes, is available through mentor sessions.

Mentor sessions can be scheduled for any number of interested parties. The materials are free. For more information about the module, or for the mentor nearest you, contact Barb Gigar at 515/747-2200.

Upcoming Workshops

Project WILD/Aquatic WILD/Project Learning Tree (PLT)

The following is a list of regional workshops which will be held this spring and early summer. Each workshop has special features based on the site and time of year. Call the contact listed for registration and cost information.

Location: Cedar Rapids (Squaw Creek Park and Grant Wood AEA)
Dates: June 21-22, 1996
Contact: Dean Hartman (1-800-332-8488)
Special Notes: This workshop will include hands-on activities and curriculum integration sessions.

Location: Guthrie Center (Springbrook Conservation Education Center)
Dates: June 7-9, 1996
Contact: Bob Rye (515/747-8383)
Special Notes: There will be special emphasis on the use of WILD and PLT to tie field trips to classroom curriculum. Be prepared for outdoor activities.

Location: Montour (Pilgrim Heights)
Dates: May 3-4, 1996
Contact: Ginny Elliott ([w] 515/484-4826 or [h] 515/484-3384)

Advanced Project WILD Aquatic Workshops

Two workshops have been designed which incorporate natural history information, field experiences, exploration of river issues and hands on (adapted) Project WILD and Project WILD Aquatic activities along with a variety of other resources. Contact Barb Gigar 515/747-2200 for details on these two programs.

Exploration of the Mississippi River
Location: Wyalusing State Park near Prairie du Chein, WI
Dates: August 13-15, 1996
Cost: $40

The Missouri -- A River of Change
Location: Iowa Western Community College, Council Bluffs
Dates: June 10-12, 1996
Cost: $25

Early Season Camping Rates In Effect At State Areas Until May 20

Outdoor enthusiasts who want to start the camping season early are reminded that lower, off-season camping fees at state park campgrounds are in effect until May 20. Camping fees are discounted during the non-summer period, which will run through May 19. Off-season camping fees are $4 per night for non-modern areas and $6 per night for modern areas during this period.

From May 20 through Sept. 3, fees for non-modern areas are $7 per night and modern areas are $9 per night. All camping areas use a self-registration procedure. A book of 14 camping tickets good year around can be obtained for $126 at any park or from the DNR's office in Des Moines.

Where electric and and/or sewer services are available, an additional fee of $3 per day for electricity and $2 per day for sewer and water is charged whether or not those services are used. Open picnic shelters are also available for rent at $20 per day, and cabins are available for $80 to $225 per week. Weeks begin and end on Saturday, with check-in at 4 p.m. and check-out at 11 a.m.

For more information see the insert, *State Parks and Recreation Areas of Iowa* in the center of this issue. For additional copies of the booklet or individual park brochures call 515/281-TENT(8638), or write DNR Parks, Wallace State Office Bldg., 900 E. Grand, Des Moines, Iowa 50319-0034.

TIP Releases 1995 Summary

Iowa's Turn In Poachers (TIP) program received and processed 353 calls in 1995, according to the Steve Dermand of the DNR's law enforcement bureau. The TIP program is administered jointly by the DNR's law enforcement bureau and TIP of Iowa, a private organization.

"All calls were assigned to our conservation officers for investigation," Dermand said. "Thirty-eight of the calls resulted in 67 citations being issued, a success rate of almost 11 percent. This is comparable to the nine to 12 percent success rates recorded in past years. In 1995, the TIP reward committee approved $6,000 in payments to informants for cases that were successfully prosecuted."

"Last year, we worked cooperatively with two major, central Iowa television stations, WHO and the FOX Network, to air three educational/promotional segments about TIP," Dermand said. "Viewer response to these one-minute clips was excellent, and one segment on deer poaching was nominated for a television media award."

For more information on TIP, contact the DNR Law Enforcement Bureau, 900 E. Grand, Des Moines, IA 50319-0034, 515/281-4515.

CONSERVATION UPDATE

Upcoming NRC, EPC and Preserves Board Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission, Environmental Protection Commission and the Preserves Advisory Board of the Iowa Department of Natural Resources.

Agendas for these meetings are set approximately 10 days prior to the scheduled date of the meeting.

For additional information, contact the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

Natural Resource Commission:
--May 9,
Waverly
--June 13,
Keosauqua
--July - no meeting

Environmental Protection Commission:
--May 20,
Des Moines
-- June 17,
Des Moines
--July 15,
Des Moines

State Preserves Advisory Board:
-- May 31,
Onawa

Water Safety Poster Contest Winners

Just'n Neddermeyer, a sixth grader from Charter Oak-Ute Community School, has won first place in the Water and Boating Safety Committee's 16th annual water safety poster contest. The theme of this year's contest was *It Won't Work If You Don't Wear It! Life Jackets Save Lives.*

In addition to winning the $100 first prize, Just'n has been invited to meet Gov. Branstad and witness the signing of Iowa's Safe Boating Proclamation in May. Rachel Barnett, a sixth grader also from Charter Oak-Ute Community School, received $50 for second place, and Aaron Allspach, a sixth grader from Baxter Community School received $25 for third place. An additional 15 students received honorable mention certificates for their drawings.

"The contest was again a big success," said DNR recreational safety coordinator Sonny Satre. "The judges had a difficult task selecting the best designs from the more than 100 entries that were submitted."

"The objective of the contest is to develop water safety awareness among young Iowans. "As we raise the contestant's water safety awareness," said Satre, "they also influence their family and friends."

All prizes were donated by IMT Insurance Company of Des Moines, and they will print a quantity of the winning poster for distribution throughout the state. Co-sponsors of the annual program are the DNR, U.S. Coast Guard Auxiliary, Des Moines Power Squadron, Safe Kids Coalition and the Midwest Regional Water Safety Council.

Jim Lawson

Jim Scheffler

1995 State Fair Grand Prize Winners, Above:
■ Jeremy Folkerts won the Old Town Otter one-person canoe donated by Jeff Holmes of CanoeSport Outfitters in Indianola.
■ Chuck Irvine Jr. of Boulevard Sports in Des Moines presented the Scrambler XT kayak to winner Jerry Maddox and son Drew.

Meeting Notice

For anyone interested in waste management issues and information on composting and recycling, both in Iowa and nationally, the BioCycle Conference on Composting and Recycling will be held Nov. 20 to 22 at the Hotel Fort Des Moines. For information contact Garth Frable at 515/ 281-5105

CLASSROOM CORNER

by Barb Gigar

Riparian Retreat

The following activity is adapted from *Project WILD Aquatic* (*PWA*), a multidisciplinary activity manual for use with students in grades K-12. *PWA* is provided to educators and youth leaders through workshops. Materials are provided free of charge with funds from Sport Fish Restoration monies through the DNR's aquatic education program.

Background:

Riparian areas are important and valuable in many ways. Riparian areas are the green ribbons of life found along the water's edge (i.e. streams, rivers). Conditions there support plant communities that grow best when their roots are near water. These zones range from narrow ribbons in desert and mountain settings to wide bands on the plains and lowlands.

Riparian areas provide space, food, water, and shelter for a variety of plants and animals. For example, leaf litter and insects falling into a stream are a source of nourishment for some aquatic life. Trees and shrubs provide shade and shelter and help hold stream banks. Runoff water is cleansed as it moves through riparian zones. Humans use riparian areas for hiking, fishing, camping, picnicking, resting and other recreational activities.

Procedure:

1. Ask students if they have a favorite stream, creek or river they like to visit. Ask them to picture an area along the banks. What was it like? Were there plants growing there? Did they see animals?

2. Next, tell students the kind of area they have been describing has a special name. It is called a "riparian" area. Riparian areas are important natural areas for people and wildlife.

3. Tell the students they are going on a "field trip" to an imaginary streamside. Students should close their eyes and picture the things being described. They will be picturing these things from their own point of view, as themselves, in the setting you describe. Invite the students to get in a comfortable position, close their eyes, and do their best to picture what they hear being described.

4. Read the following description (on pages 57 and 58) to the students:

"It is a hot summer day. You are walking in a meadow filled with knee-high grasses. Here and there are masses of tiny blue wildflowers . . . . The ground beneath your feet is uneven, but you are not in a hurry as you walk slowly toward a grove of trees. As you near the trees, you notice the changing colors of green . . . . A breeze whispers through, showing first a shiny green, then a dull green underside of the leaves. As you step into the trees, you are surrounded by cool . . . . You feel the protection of the canopy of green overhead . . . . A tap-tap-tapping sound breaks into your thoughts. Searching among the rough-barked trunks, you finally spot a bird -- black and white, with a touch of red on its head -- clinging to the side of the tree, bobbing its head in time to the rhythmic tapping . . . . As you stand amongst the cool trees, you breathe deeply -- the very scent of green comes to you . . . . The aroma of earth and growing things is strong and you detect here and there almost a memory of the sweet perfume of the flowers . . . . Once in a while the pungent, but not unpleasant, odor of wet soil and last season's decaying leaves catches your attention.

continued on page 58

Age:

Grades 6-12

Objective:

Students will:

1. describe habitat characteristics of riparian areas;

2. identify animals that inhabit them; and

3. state the importance of riparian areas to wildlife and humans.

Materials:

art materials: water colors, acrylics, poster paints, crayons, paper

Additional Resources:

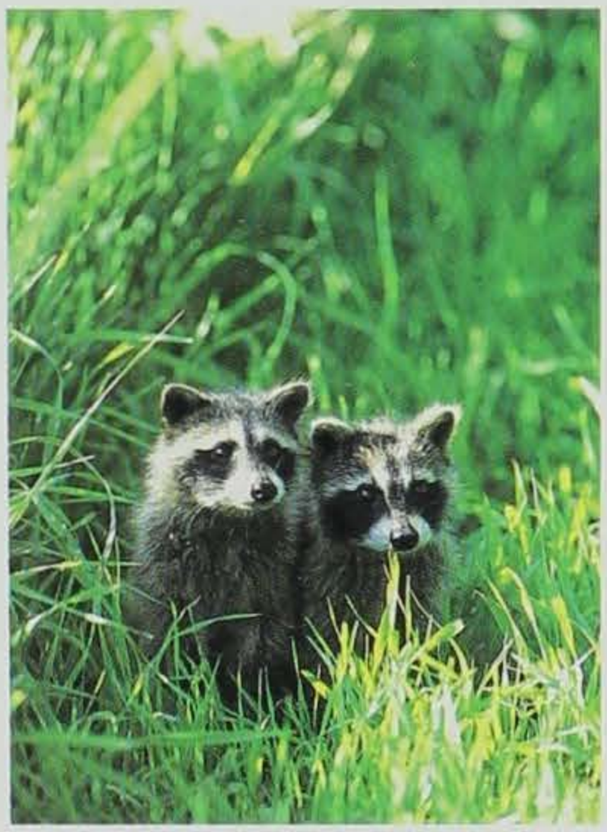
For more information about the importance of riparian areas along rivers and streams in your area, contact your local county conservation board. To learn more about protected waters (and riparian areas) statewide, contact: Janet Ott, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, IA 50319-0034.

Extensions:

1. Visit a riparian area and search for things described in the simulated field trip. List things that you *did not* picture in your mind which you found there.

2. List things that could be done to allow people to visit a riparian area without damaging or destroying it.

3. Write a paragraph or poem to describe your favorite image from the simulated field trip.



Roger A. Hill

■ **Riparian areas are vital to humans and many kinds of wildlife.**

Barb Gigar is coordinator for the department's aquatic education program, Project WILD *and* Project Learning Tree *at the department's Springbrook Conservation Education Center in Guthrie County.*

As you continue to explore, you notice the trees are farther apart than before . . . . Grass, which earlier reached your knees, is being overshadowed by chest-high bushes. The branches snag your clothing . . . . Your arms are lightly scratched by the twig ends. Several bushes are covered with small berries, pink and pale green, ripening to red in the warm sun. The bushes get taller . . . . You are now pushing aside thick, tangled willows taller than your head . . . . You carefully step along the precarious trail beneath your feet. Suddenly your foot drops several inches and, examining the ground more closely, you notice that, where you stepped, the tunnel of a burrowing animal has collapsed beneath your weight.

Moving on, you feel the whisper of a spider web touch your cheek. Brushing it aside, you notice the slope of the land is steeper . . . . You pause to listen . . . . The high drone of insects has come upon you so gradually, it seems almost frighteningly loud . . . . Lower in pitch and volume, there's the sound of water spilling over rocks. Above, where the water must be, you see hundreds of tiny spots milling before your eyes, the creators of that high buzzing sound -- swarming insects in a thick cloud . . . . An iridescent green dragonfly flashes by, darting here, pausing, darting there, pausing, snatching dozens of the dots, relishing the unending insect buffet.

You duck beneath the swarming insects, moving toward the sound of the moving water. Using your arms you make a space between tan and green willows that bounce back, undisturbed, in your wake. Your eyes comb the scene for a place to rest and you see a large rock ahead -- gray, warm and not yet water-smoothed . . . . You pause to pick up a handful of pebbles from the stream bed as you step across larger stones and swing up onto the dry perch of the rock. You toss the stones one at a time into the water, listening to the pleasing "plop."

Looking down near the base of your rock you notice all kinds of small insects dancing across and above the water. A small ripple occurs in the water, then another . . . . You realize fish are feeding on the insects. Birds dart in and out of the trees . . . . Downstream a frog begins to croak . . . . More frogs join in. You sit a while and listen to the sounds and take in the scenery . . . . Bask in the sun on the warm rock . . . . Feel the warmth of the sun stored in the rock. Close your eyes and see the warm red of the sun though your eyelids. Much too soon it seems, you have to leave your rock and head back home . . . . With your eyes still closed, stretch out, feeling the warmth in your muscles as you reluctantly get up to go home."

5. Ask the students to sit quietly with their eyes closed and review their "trip" to the stream. Ask them to pay particular attention to their favorite images. Have students open their eyes and invite them to share their favorite image. Once all who wish to share have done so, each student should draw or paint his/her favorite images on the paper provided. Finished art work can be displayed.

6. Ask students to list some characteristics of the riparian area. What kinds of plants are there? Animals? How did the area change as they approached the water? Ask the students to list, describe and discuss some reasons why riparian areas are important.

Evaluation:

Have students discuss the following:

1. What is a riparian area?

2. Name four animals that you would expect to find in a riparian area.

3. Why are riparian areas important to wildlife? To humans? Why are riparian areas intrinsically valuable? Write a poem to explain your response.

4. Describe your position on a plan to develop a riparian area for recreational use by hikers, bird watchers and other "low impact" users. A parking area, rest rooms, walkways and other needs such as garbage removal must be considered.

■ Scarlet tanager, one of Iowa's neotropical species.

Lowell Washburn

For the Birds

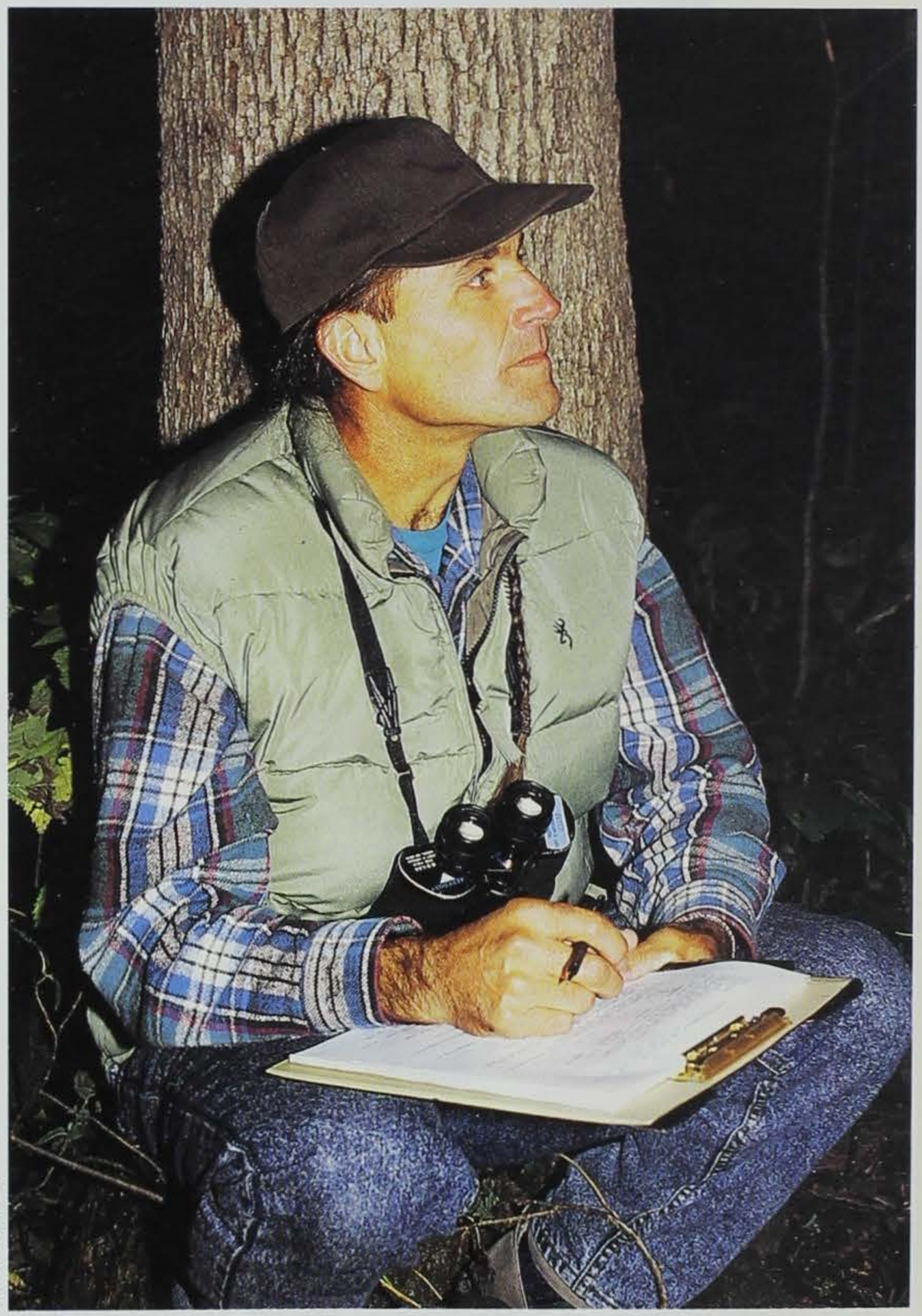
Northeast Iowa is the site of joint three-year project studying neotropical songbirds.

by Lowell Washburn

A three-year, $200,000 research project aimed at identifying and protecting the habitats used by forest bird life has been launched in the state's rugged northeastern corner. The project is a joint venture of the Iowa Department of Natural Resources, the U.S. Fish and Wildlife Service, Iowa State University, Trees Forever and the Iowa Chapter of the Nature Conservancy.

"One of our initial goals is to document what types of birds are using specific types of forest habitat," said Lisa Hemesath, DNR wildlife biologist and project leader. "Although we are recording all of the species of birds we encounter, from owls to turkeys, our primary focus is on neotropical songbirds such as tanagers and warblers."

Neotropical birds are those which nest in or migrate northward through Iowa during the spring and summer, but spend the winter months below the U.S. border in Mexico, Central and South America. Experts contend that many species of neotropical birds are suffering an ongoing and dramatic decline in numbers. "Essentially, we are comparing the birds and vegetation found in pristine forest habitats to those wood-



Lowell Washburn

lands which have suffered varying degrees of alteration," Hemesath said. Heavily altered timbers include those which are overgrazed or have endured poor or abusive logging practices.

Because of the rugged nature of northeast Iowa's landscape, choosing the sites for studying Iowa's forest bird life proved to be no easy task. "Last year we conducted a lot of the preliminary reconnaissance work and spent a lot of our time making landowner contacts," said Bill Norris, who is one of the project leaders and an ISU PhD student. "We finally narrowed it down to 80 tracts of land," Norris added. "We then reduced that to 45 actual research sites varying in size from 80 to 1,800 acres." Hemesath said 200 census sites have been established within those 45 areas. Each site consists of a single marked tree that usually requires the use of a compass and topographical map to locate.

"We've been lost a few times but have managed to find our tree," Hemesath said. "We are in the woods and actually counting birds by 5 o'clock each morning. By 9:30 or 10, we're usually done counting because the birds tend to quiet down as the woods heat up. Because of thick summer foliage, 90 percent of the census is conducted by listening to birds calls.

After 10 a.m., researchers turn to the more mundane work of identifying and measuring plant species. "Every tree, shrub, sapling and vine in an individual plot is counted and measured," said Norris. "Sometimes it gets pretty steamy in there," he laughed. Project workers expect it will take two years to complete the vegetation measurement.

"Because of its rugged topography, this area of the state has not been looked at very thoroughly," said Norris. "So far it's been pretty exciting. We've found a half-dozen warbler species, including the Kentucky warbler. We've also found winter wrens and red-shouldered hawks. We knew these birds might be here, but I think we've all been pleasantly surprised by the overall numbers. The cooperation of these landowners has really been phenomenal," Norris added. Ninety percent of the landowners contacted agreed to give project workers access to their land.

Ron Johnson

From left:
- The northeast Iowa study is using 200 sites to census forest bird life.
- Ruby-throated humming birds rely on Iowa's timberland for nesting and spend the winter south of the U.S. border.
- Responsible timber management is the key to maintaining diversity of both plant and animal life.

Lowell Washburn

"When we first approached them and started talking about birds, they really perked up," said Norris. "Now that we're actually on the sites, they are really interested in what we're finding. Many of these farmers are also bird feeders and are really interested in things like the jays and the cardinals that they attract to their feeders. However, many of these same people do not realize what they have living in the back 40," he added. "Some of them really get pumped when they find out they have scarlet tanagers or pileated woodpeckers on the property. This is very encouraging."

"We're finding our greatest diversity of bird species in the undisturbed woodlands which, in turn, offer the greatest diversity of plant life," said Hemesath. In essence, pristine habitats mean more warblers and other desirable songbirds, while extremely stressed environments mean less diversity and more nonnative birds such as starlings.

"We don't really know very much about managing for most of our non-game forest wildlife, but we are improving on that. "Hopefully, we will be able to say that if you want to have such and such kind of birds on your property, then here's what you do to get them."

WARDEN'S DIARY

by Chuck Humeston

"Not Fair"

Now, it's a fact of life, if you have a job as a law enforcement officer, you will at some time make someone unhappy. Nobody likes to get a ticket (me included). Nobody likes to be arrested. And sometimes, as any human being does, an officer may make a mistake.

Sometimes though, just our *doing* the job we do causes a person to complain, "Not Fair!" I've found many of these "not fair" complaints fall into several predictable groups.

First, "The officer used bad judgment!" Translated -- "Catch those other law-breakers, but when I break the law, leave me alone."

Second, "The officer was rude!" Translated -- "I should be able to yell in the officers' faces, berating everything from their family heritage to their mental capacity. So, I'm mad because the officers got tired of listening to it and arrested me!"

Third, "The officers don't do their jobs!" Translated -- "I decided to break the law because many times I got away with it, and I've seen others do the same thing. But, this time *I* got caught, and they didn't!"

Most of the "it's not fair, why me?" complaints usually are a slight variation on these themes. The participants, surroundings and seasons change but the "not fair" complaints remain much the same.

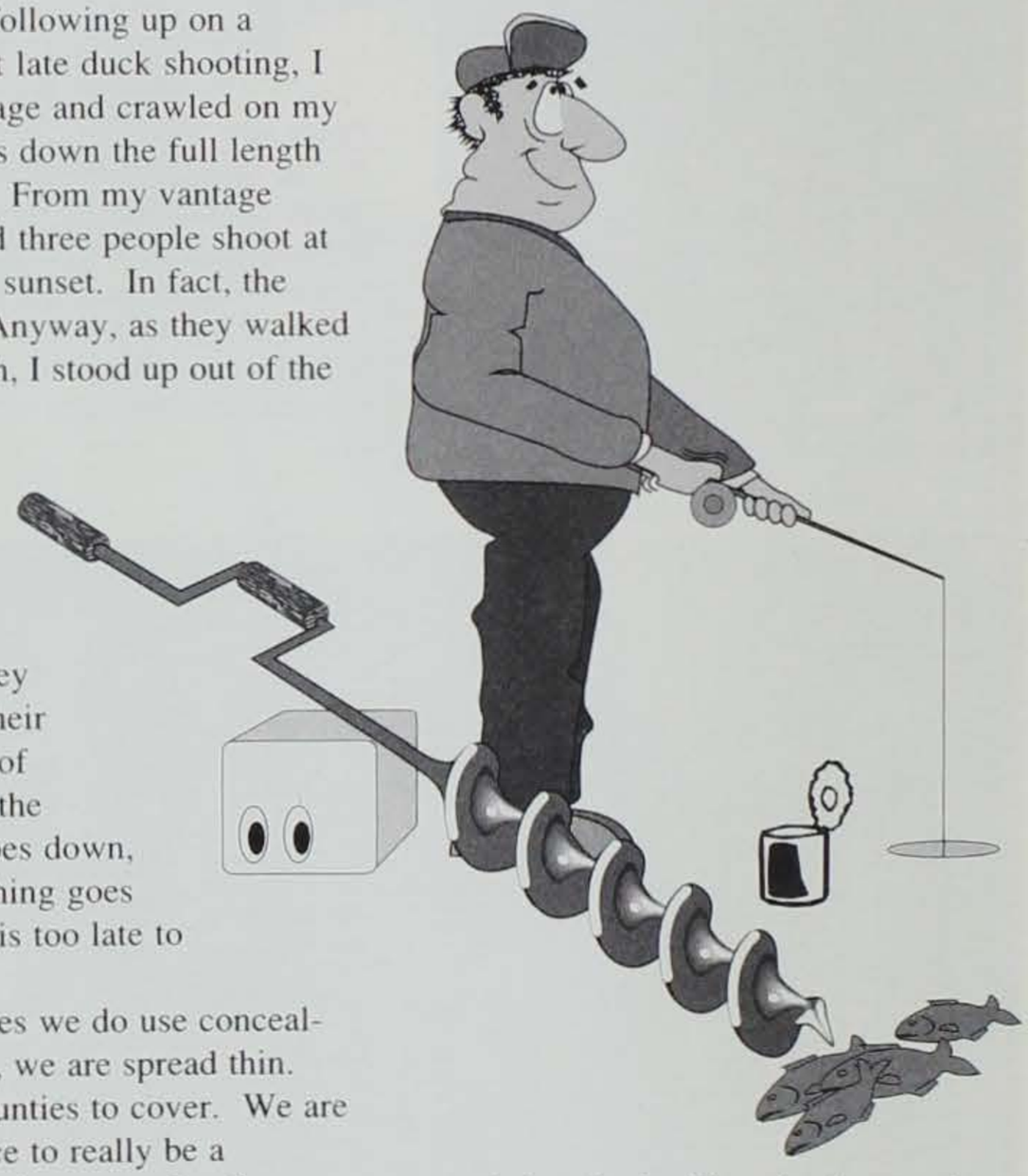
Recently, one of the officers I work with was the subject of a complaint charging, "The officer, hides in the weeds looking for tickets to write."

Mea Culpa! Yes, we have hidden in the weeds.

Personally, I've also hidden in trees, bushes, snowdrifts, culverts -- anything I have been *able* to hide in. (Hey, I didn't say large enough to hide me, I said anything I was able to hide in!)

One time, following up on a complaint about late duck shooting, I put on camouflage and crawled on my hands and knees down the full length of a CRP field. From my vantage point, I watched three people shoot at ducks way past sunset. In fact, the moon was up. Anyway, as they walked out of the marsh, I stood up out of the grass in front of them and said, "Hi there."

Very nonchalantly they told me they had forgotten their watches. Rule of thumb -- when the yellow thing goes down, and the white thing goes up, it probably is too late to shoot.



Yes, at times we do use concealment. You see, we are spread thin. We have 99 counties to cover. We are too small a force to really be a deterrent, so we have to strive for paranoia. In other words, a lot of times we hear, "Where did you come from?"

My favorite example of "concealment" concerns officer Ken Lonneman. Now, Ken had a guy in his territory who liked to tell people about all the lines he would use ice fishing, and he often boasted Ken would never catch him. He took a real delight both in having too many lines and in saying he was just too smart to be caught.

One day, Ken dressed up in coveralls and armed himself with the prerequisite five-gallon bucket and ice auger. He went out and dug a hole in the ice and sat on the bucket as if he were fishing.

After a while, Ken got up and dug another hole a *little* closer to the man's ice shack. Then he dug another one a *wee bit* closer. He repeated this several times until he judged he was "close enough." He made a mad dash for the shack and pulled open the door to find the fisherman sitting there, open-mouthed and wide-eyed, with far more than the limit of two fishing lines in the water. I guess what Ken did could be called "hiding on an ice cube."

So, yes we do hide. Yes, we may come from anywhere. But to get back to the man's complaint about the officer "hiding in the weeds." This particular complaint followed a ticket for boating violations . . . given in the middle of a lake. The officer was out there doing his job, his name and reputation displayed for everyone to see. Somebody got caught. Only to them did it seem "not fair."

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